Access DB# 128495

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Ling Xu Examiner # : 77924 Date: 7-29-04
Art Unit: 1775 Phone Number 30 272-1546 Serial Number: 10/671,406
Mail Box and Bldg/Room Location: 5D60 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

****

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: _____

Inventors (please provide full names): _____

_____

Earliest Priority Filing Date: _____

***For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.**

Please see attached.

****

STAFF USE ONLY **Type of Search** **Vendors and cost where applicable**

128495

SEARCH REQUEST FORM

Scientific and Technical Information Center

Examiner# : 77924
Art Unit : 1775
Phone Number: 272-1546
Date: 7/29/2004
Serial Number: 10/671,406
MailBox & Bldg/Room Location: Remsem 5D60
Results Format Preferred (circle): Paper Disk E-mail

If more than one search is submitted, please prioritize searches in order of need.

****

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc., if known. Please attach a copy of the coversheet, pertinent claims, and abstract.

Title of Invention:

Novel heterocyclic compounds, materials for light emitting devices and light emitting devices using the same

Inventors (please provide full names):

Hisashi Okada, Toshihiro Ise

Earliest Priority Filing Date: 7/22/1999

For Sequence Searches Only Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

Please search the compound in claims 1 and 14.

Please call me if you have any questions.

Thanks

Lucy Xu

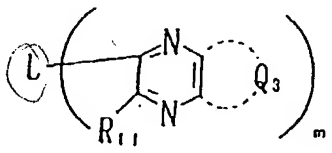
AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

Claim 1. (currently amended): A light emitting device comprising at least one organic layer including a light emitting layer between a pair of electrodes,

wherein the at least one organic layer comprises at least one compound represented by the following formula (XI):



(XI)

wherein ~~Q3~~Q_3 represents an atomic group necessary to form ~~an~~ a 5-membered aromatic heterocycle; R_{11} represents a hydrogen atom or a substituent; m represents an integer of 2 or more; and L represents a connecting group.

Claim 2. (currently amended): The light emitting device of claim 1, wherein L represents a single bond or a group selected from the group consisting of~~comprising~~ alkylene, alkenylene, alkynylene, arylene, a divalent aromatic heterocycle or a combination of three arylenes with N.

Claim 3. (currently amended): The light emitting device of claim 2, wherein L represents a group selected from the group consisting of ~~comprising~~ arylene, a divalent aromatic heterocycle or a combination of three arylenes with N.

Claim 4. (currently amended): The light emitting device of claim 1, wherein Q_3 represents an atomic group necessary to form a 5-membered nitrogen-containing aromatic heterocycle.

Claim 5. (canceled).

Claim 6. (currently amended): The light emitting device of claim 1, wherein Q_3 represents an atomic group required to form a furan, thiophene, ~~pyran,~~ pyrrole, imidazole, pyrazole, ~~pyridine, pyrazine, pyrimidine, pyridazine,~~ thiazole, oxazole, isothiazole, isoxazole, thiadiazole, oxadiazole, triazole, selenazole or tellurazole.

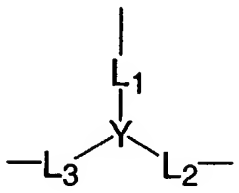
Claim 7. (currently amended): The light emitting device of claim 6, wherein Q_3 represents an atomic group required to form ~~a~~ an imidazole, pyrazole, thiazole, oxazole, isothiazole, isoxazole, thiadiazole, oxadiazole or triazole~~pyridine, pyrazine, pyrimidine or pyridazine~~.

Claim 8. (original): The light emitting device of claim 1, wherein m is 2 to 8.

Claim 9. (original): The light emitting device of claim 8, wherein m is 2 to 4.

Claim 10. (original): The light emitting device of claim 9, wherein m is 3.

Claim 11. (original): The light emitting device of claim 1, wherein L represents

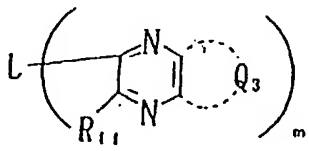


wherein L_1, L_2, and L_3 each represents a connecting group; and Y represents a nitrogen atom or a 1,3,5-benzenetriyl group and wherein m is 3.

Claim 12. (original): The light emitting device of claim 11, wherein Y represents 1,3,5-benzenetriyl and wherein L_1, L_2, and L_3 each represents a single bond.

Claim 13. (original): The light emitting device of claim 1, further comprising a polymer in the at least one organic layer.

Claim 14. (currently amended): A compound represented by the following formula (XI):



(XI)

wherein Q_3 represents an atomic group necessary to form a 5-membered~~an~~ aromatic heterocycle; R_{11} represents a hydrogen atom or a substituent; m represents an integer of 2 or more; and L represents a connecting group.

Claim 15. (currently amended): The compound of claim 14, wherein L represents a single bond or a group selected from the group consisting of~~comprising~~ alkylene, alkenylene, alkynylene, arylene, a divalent aromatic heterocycle or a combination of three arylenes with N.

Claim 16. (currently amended): The compound of claim 15, wherein L represents a group selected from the group consisting of~~comprising~~ arylene, a divalent aromatic heterocycle or a combination of three arylenes with N.

Claim 17. (currently amended): The compound of claim 14, wherein Q_3 represents an atomic group necessary to form a 5-membered nitrogen-containing aromatic heterocycle.

Claim 18. (canceled).

Claim 19. (currently amended): The compound of claim 14, wherein Q_3 represents an atomic group required to form a furan, thiophene, ~~pyran,~~ pyrrole, imidazole, pyrazole, ~~pyridine, pyrazine, pyrimidine, pyridazine,~~ thiazole, oxazole, isothiazole, isoxazole, thiadiazole, oxadiazole, triazole, selenazole or tellurazole.

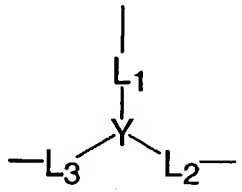
Claim 20. (currently amended): The compound of claim 19, wherein Q_3 represents an atomic group required to form an imidazole, pyrazole, thiazole, oxazole, isothiazole, isoxazole, thiadiazole, oxadiazole or triazole~~a pyridine, pyrazine, pyrimidine or pyridazine~~.

Claim 21. (original): The compound of claim 14, wherein m is 2 to 8.

Claim 22. (original): The compound of claim 21, wherein m is 2 to 4.

Claim 23. (original): The compound of claim 22, wherein m is 3.

Claim 24. (original): The compound of claim 14, wherein L represents



wherein L_1, L_2, and L_3 each represents a connecting group; and Y represents a nitrogen atom or a 1,3,5-benzenetriyl group and wherein m is 3.

Claim 25. (original): The compound of claim 24, wherein Y represents 1,3,5-benzenetriyl and wherein L_1, L_2, and L_3 each represents a single bond.

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USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
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L4              0 S L3

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L6           1499 S TOSHIHIRO ?/AU OR ISE ?/AU
L7             24 S L5 AND L6
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     FILE 'ZCAPLUS'
L18            25 S L16


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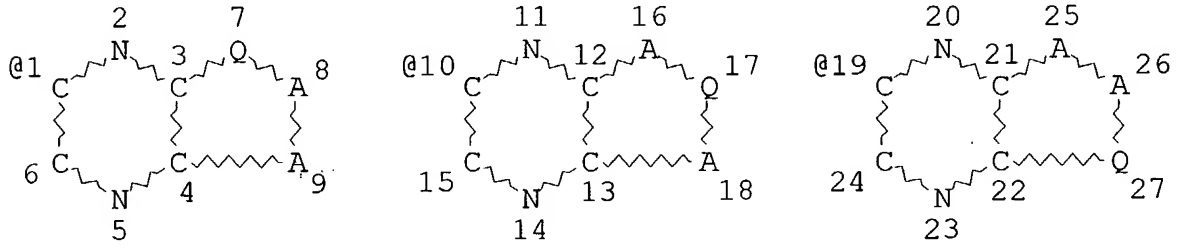

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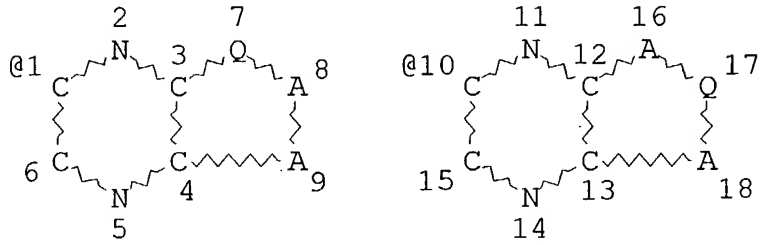

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100.0% PROCESSED 162 ITERATIONS 82 ANSWERS
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FILE 'ZCAPLUS' ENTERED AT 00:30:28 ON 31 JUL 2004

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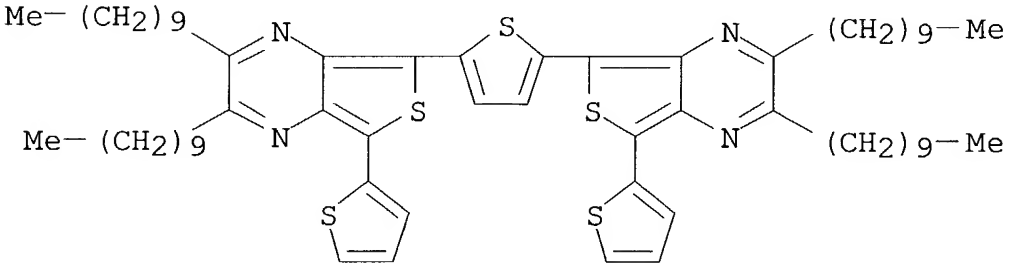
L18 ANSWER 1 OF 25 ZCAPLUS COPYRIGHT 2004 ACS on STN
2002:12559 Document No. 136:238664 Structure/property relations in the linear and third order nonlinear optical properties of substituted oligothiophenes. Van Keuren, Edward; Andreaus, Reinhard; Mohwald, Helmut; Schrof, Wolfgang; Wakebe, Takanori; Belov, Vladimir; Matsuda, Hiro; Rangel-Rojo, Raul (Department of Physics, Georgetown University, Washington, DC, USA). MCLC S&T, Section B: Nonlinear Optics, 28(1-2), 61-76 (English) 2001. CODEN: MCLOEB. ISSN: 1058-7268. Publisher: Gordon & Breach Science Publishers.

AB In studies of optical properties of polymers, a better understanding of structure/property relations can be achieved through the study of the corresponding oligomer systems. Using the Stille coupling reaction, a no. of novel oligothiophene derivs. were synthesized with systematic variation in the no. of repeat units, the position and no. of substituents and in one case, substitution of Se for S in some of the heteroatoms. The linear and nonlinear optical characteristics of these oligomers in soln. were measured at both resonant and nonresonant wavelengths, and some simple structure/property relations could be detd. While the no. and type of substituent groups as well as the main chain length had large effects on the optical properties, the figure of merit relevant to optical switching applications was little changed.

IT **195831-39-1 402961-98-2**
(Structure/property relations in linear and third order nonlinear optical properties of substituted oligothiophenes)

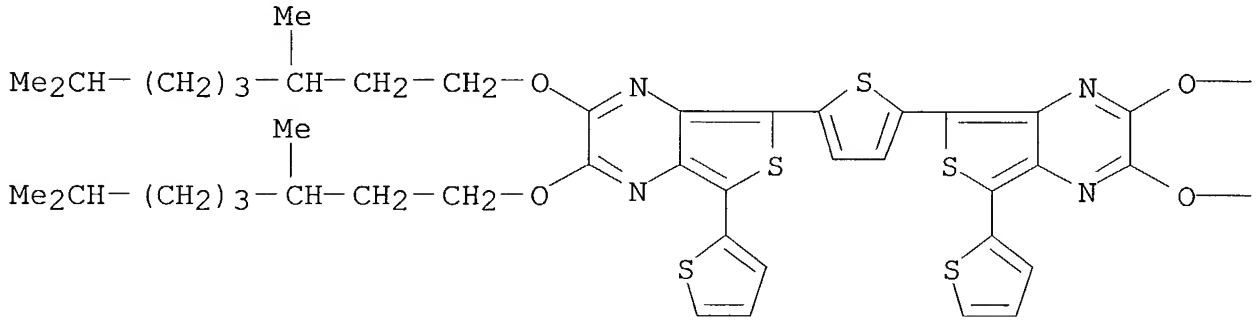
RN 195831-39-1 ZCAPLUS

CN Thieno[3,4-b]pyrazine, 5,5'-(2,5-thiophenediyl)bis[2,3-didecyl-7-(2-thienyl)- (9CI) (CA INDEX NAME)

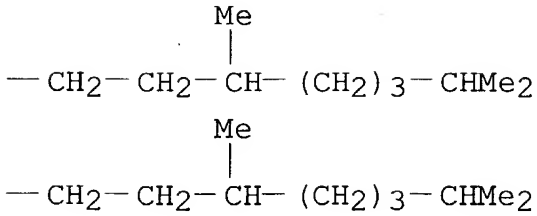


RN 402961-98-2 ZCAPLUS
CN Thieno[3,4-b]pyrazine, 5,5'-(2,5-thiophenediyl)bis[2,3-bis[(3,7-dimethyloctyl)oxy]-7-(2-thienyl)- (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 1-B

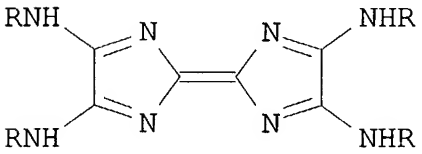


IT **195831-39-1 402961-98-2**
(Structure/property relations in linear and third order nonlinear optical properties of substituted oligothiophenes)

L18 ANSWER 2 OF 25 ZCAPLUS COPYRIGHT 2004 ACS on STN
2000:825268 Document No. 134:147568 A short and efficient synthesis of pyrazino-fused tetraazafulvalenes. Kapplinger, Christian; Beckert, Rainer (Institut fur Organische und Makromolekulare Chemie,

Friedrich-Schiller-Universitat Jena, Jena, D-07743, Germany). Synlett (11), 1679-1681 (English) 2000. CODEN: SYNLES. ISSN: 0936-5214. OTHER SOURCES: CASREACT 134:147568. Publisher: Georg Thieme Verlag.

GI



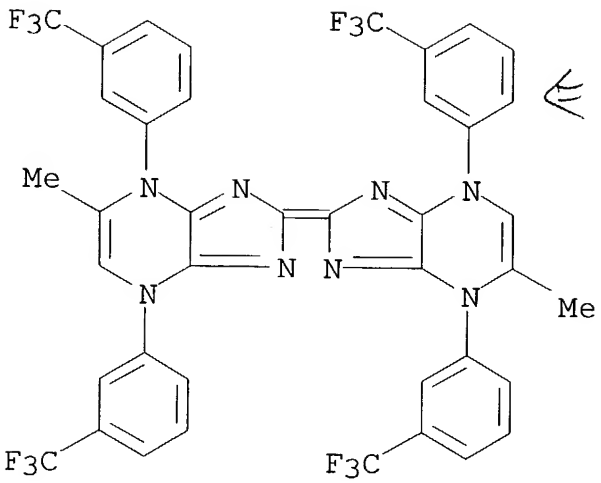
I

AB The tetraazafulvalenes I {R = 3-CF3C6H4, 3,5-[Me(CH2)7O2C]2C6H3, 4-IC6H4} are easily transformed into the corresponding pyrazino-fused derivs. via cyclization of both vicinal secondary arylamino functions with ClCH2CH(OEt)2. Similarly, in the course of a complex reaction, EtCH(OEt)2, PhCH2CH(OEt)2, EtCPh(OEt)2, and PhCH2CPh(OEt)2 lead to deeply blue colored ring fused products. This easily feasible annulation reaction is applicable to other heterocycles which contain a comparable bis-amidine substructure as exemplified for 2,3-bis[arylamino]quinoxalines.

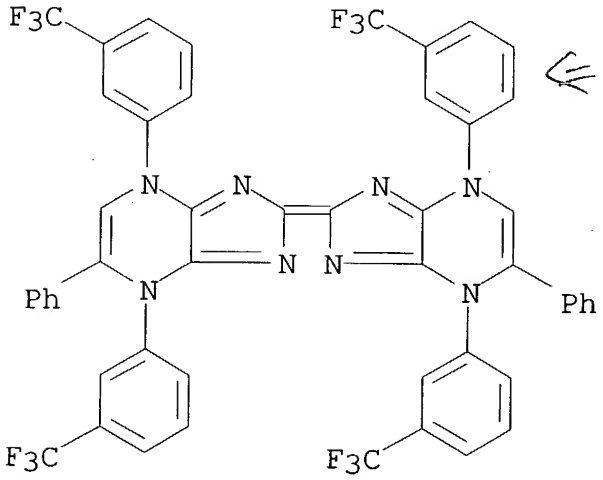
IT **324011-20-3P 324011-21-4P 324011-22-5P**
324011-23-6P 324011-25-8P 324011-27-0P
(prepn. of pyrazino-fused tetraazafulvalenes)

RN 324011-20-3 ZCAPLUS

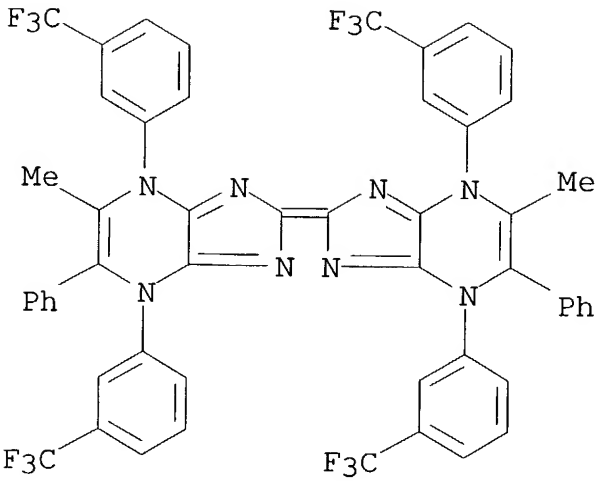
CN 2H-Imidazo[4,5-b]pyrazine, 2-[4,7-dihydro-5-methyl-4,7-bis[3-(trifluoromethyl)phenyl]-2H-imidazo[4,5-b]pyrazin-2-ylidene]-4,7-dihydro-5-methyl-4,7-bis[3-(trifluoromethyl)phenyl]- (9CI) (CA INDEX NAME)



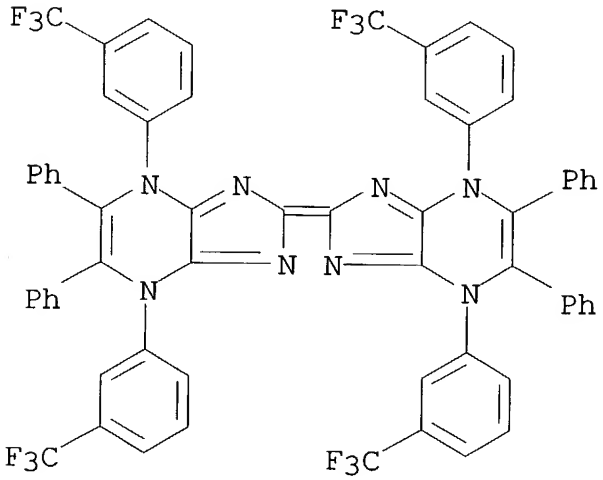
RN 324011-21-4 ZCAPLUS
CN 2H-Imidazo[4,5-b]pyrazine, 2-[4,7-dihydro-5-phenyl-4,7-bis[3-(trifluoromethyl)phenyl]-2H-imidazo[4,5-b]pyrazin-2-ylidene]-4,7-dihydro-5-phenyl-4,7-bis[3-(trifluoromethyl)phenyl]- (9CI) (CA INDEX NAME)



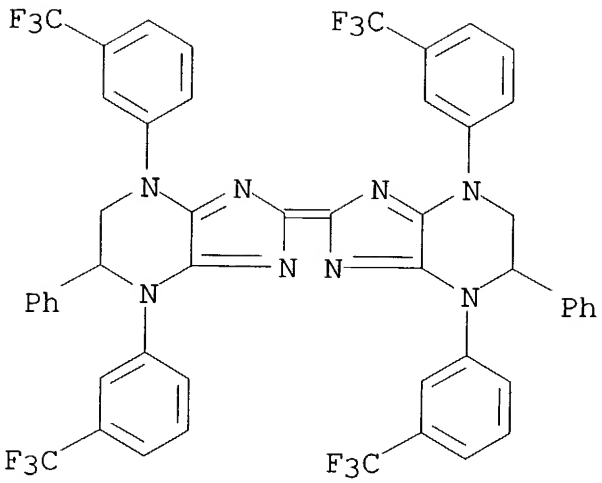
RN 324011-22-5 ZCAPLUS
CN 2H-Imidazo[4,5-b]pyrazine, 2-[4,7-dihydro-5-methyl-6-phenyl-4,7-bis[3-(trifluoromethyl)phenyl]-2H-imidazo[4,5-b]pyrazin-2-ylidene]-4,7-dihydro-5-methyl-6-phenyl-4,7-bis[3-(trifluoromethyl)phenyl]- (9CI) (CA INDEX NAME)



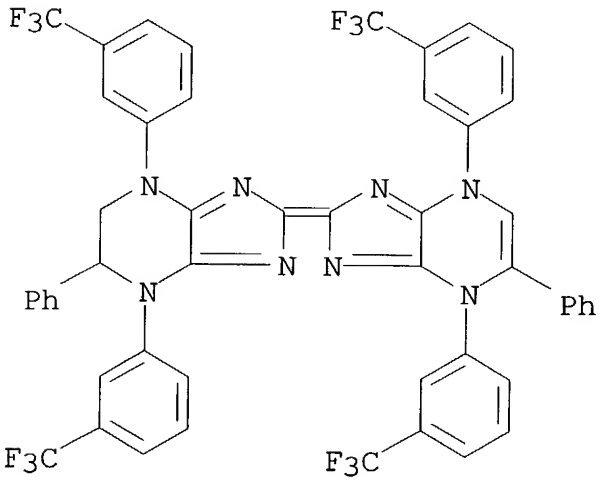
RN 324011-23-6 ZCAPLUS
CN 2H-Imidazo[4,5-b]pyrazine, 2-[4,7-dihydro-5,6-diphenyl-4,7-bis[3-(trifluoromethyl)phenyl]-2H-imidazo[4,5-b]pyrazin-2-ylidene]-4,7-dihydro-5,6-diphenyl-4,7-bis[3-(trifluoromethyl)phenyl]- (9CI) (CA INDEX NAME)



RN 324011-25-8 ZCAPLUS
CN 2H-Imidazo[4,5-b]pyrazine, 4,5,6,7-tetrahydro-5-phenyl-2-[4,5,6,7-tetrahydro-5-phenyl-4,7-bis[3-(trifluoromethyl)phenyl]-2H-imidazo[4,5-b]pyrazin-2-ylidene]-4,7-bis[3-(trifluoromethyl)phenyl]- (9CI) (CA INDEX NAME)



RN 324011-27-0 ZCAPLUS
CN 2H-Imidazo[4,5-b]pyrazine, 2-[4,7-dihydro-5-phenyl-4,7-bis[3-(trifluoromethyl)phenyl]-2H-imidazo[4,5-b]pyrazin-2-ylidene]-4,5,6,7-tetrahydro-5-phenyl-4,7-bis[3-(trifluoromethyl)phenyl]- (9CI) (CA INDEX NAME)



IT **324011-20-3P 324011-21-4P 324011-22-5P**
324011-23-6P 324011-25-8P 324011-27-0P
(prepn. of pyrazino-fused tetraazafulvalenes)

L18 ANSWER 3 OF 25 ZCAPLUS COPYRIGHT 2004 ACS on STN
1999:456264 Document No. 131:170326 TCNQ analogs composed of heterocyclic rings. Suzuki, K.; Tomura, M.; Yamashita, Y. (Department of Structural Molecular Science, The Graduate University

for Advanced Studies and Institute for Molecular Science, Okazaki, 444-8585, Japan). Synthetic Metals, 102(1-3), 1480-1481 (English) 1999. CODEN: SYMEDZ. ISSN: 0379-6779. Publisher: Elsevier Science S.A..

GI

* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT *

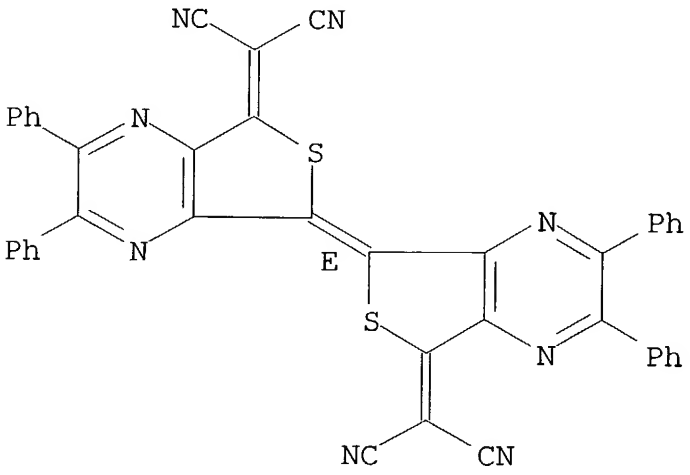
AB Thiophene-TCNQ analog I and bithiophene-TCNQ analogs II (R = Ph, Me), contg. fused pyrazine rings, were synthesized. A bithiophene analog with 1,2,5-thiadiazole rings (III) was also prepd. using the reaction of tetracyanoethylene oxide. Their mol. and crystal structures were revealed by x-ray anal. III has a unique three dimensional structure involving short S···N contacts.

IT **238756-87-1P 238756-88-2P**
(TCNQ thiophene analogs composed of heterocyclic rings)

RN 238756-87-1 ZCAPLUS

CN Propanedinitrile, [(7E)-7-[7-(dicyanomethylene)-2,3-diphenylthieno[3,4-b]pyrazin-5(7H)-ylidene]-2,3-diphenylthieno[3,4-b]pyrazin-5(7H)-ylidene]- (9CI) (CA INDEX NAME)

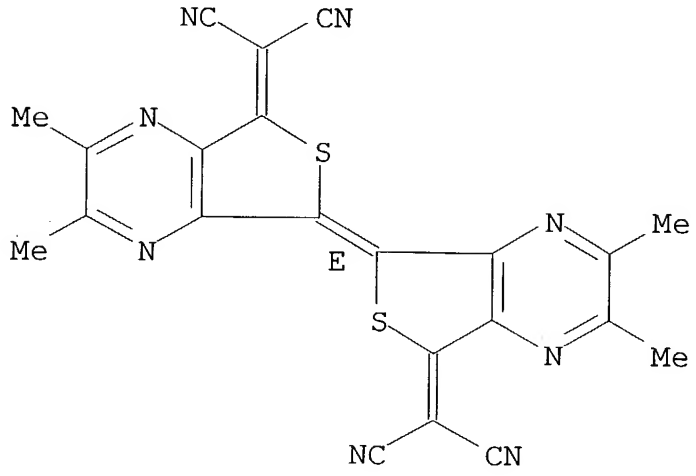
Double bond geometry as shown.



RN 238756-88-2 ZCAPLUS

CN Propanedinitrile, [(7E)-7-[7-(dicyanomethylene)-2,3-dimethylthieno[3,4-b]pyrazin-5(7H)-ylidene]-2,3-dimethylthieno[3,4-b]pyrazin-5(7H)-ylidene]- (9CI) (CA INDEX NAME)

Double bond geometry as shown.



IT **238756-87-1P 238756-88-2P**
(TCNQ thiophene analogs composed of heterocyclic rings)

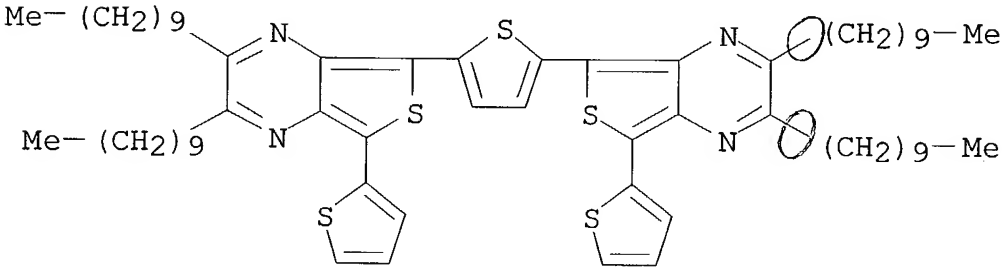
L18 ANSWER 4 OF 25 ZCAPLUS COPYRIGHT 2004 ACS on STN
1999:84140 Document No. 130:252752 Linear and third order nonlinear optical properties of substituted oligothiophenes. Van Keuren, Edward; Mohwald, Helmut; Rozouvan, Stanislaw; Schrof, Wolfgang; Belov, Vladimir; Matsuda, Hiro; Yamada, Shinji (Advanced Polymer Research, BASF AG, Yokkaichi, Japan). Journal of Chemical Physics, 110(7), 3584-3590 (English) 1999. CODEN: JCPSA6. ISSN: 0021-9606. Publisher: American Institute of Physics.

AB The linear absorption spectra and third order nonlinear optical properties of substituted oligothiophenes were studied using Z-scan methods at various wavelengths. The substituted oligothiophenes were prepd. by Stille coupling of 5,7-dibromo-2,3-didecylthieno[3,4-b]pyrazine and 2,5-bis(trimethyltin)thiophene, under conditions that limit polymn. As in other conjugated oligomers, the properties depend strongly on chain length. A significant dependence on the substituent type, no., and position, was obsd., with strong enhancement of the oscillator strength for asym. substitution. The resonance nonlinear absorption shows strong satn. behavior, changing to induced absorption off-resonance. The nonlinear refractive index was neg. near resonance, suggesting the possibility of thermal effects. While the off-resonant nonlinear refractive index was small, the values were neg., suggesting that resonant enhancement still plays a role.

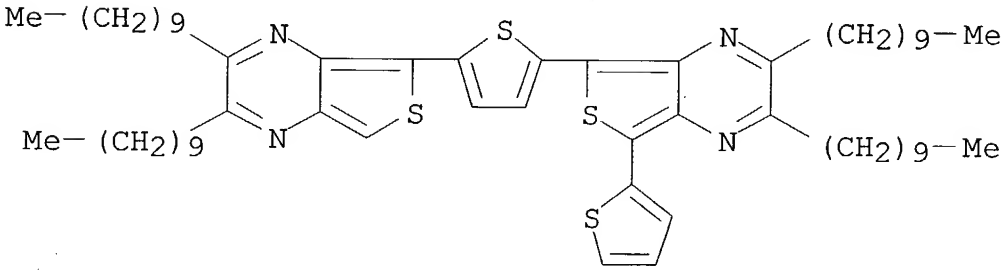
IT **195831-39-1P 221615-65-2P**
(prepn. of substituted oligothiophenes and effects of substituent on linear and third order nonlinear optical properties)

RN 195831-39-1 ZCAPLUS

CN Thieno[3,4-b]pyrazine, 5,5'-(2,5-thiophenediyl)bis[2,3-didecyl-7-(2-thienyl)- (9CI) (CA INDEX NAME)

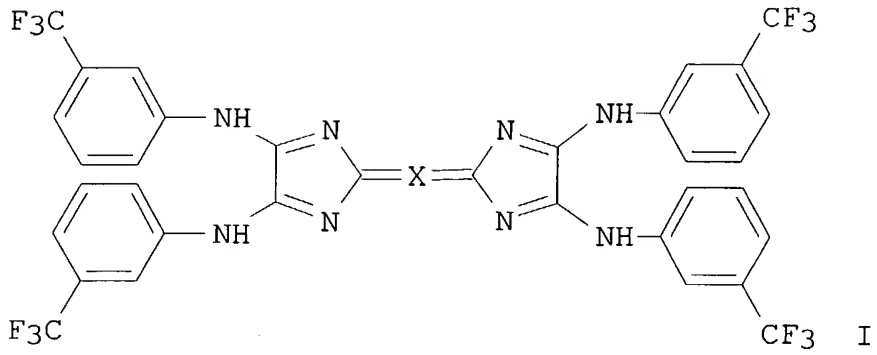


RN 221615-65-2 ZCAPLUS
CN Thieno[3,4-b]pyrazine, 2,3-didecyl-5-[5-(2,3-didecylthieno[3,4-b]pyrazin-5-yl)-2-thienyl]-7-(2-thienyl)- (9CI) (CA INDEX NAME)



IT **195831-39-1P 221615-65-2P**
(prepn. of substituted oligothiophenes and effects of substituent on linear and third order nonlinear optical properties)

L18 ANSWER 5 OF 25 ZCAPLUS COPYRIGHT 2004 ACS on STN
1998:341707 Document No. 129:109035 Stable tetraazafulvalenes. Synthesis and chemistry. Kaepplinger, Christian; Beckert, Rainer; Imhof, Wolfgang (Institut Organische Makromolekulare Chemie, Friedrich-Schiller-Universitaet, Jena, D-07743, Germany). Journal fuer Praktische Chemie/Chemiker-Zeitung, 340(4), 323-333 (German) 1998. CODEN: JPCCEM. ISSN: 0941-1216. OTHER SOURCES: CASREACT 129:109035. Publisher: Johann Ambrosius Barth.
GI



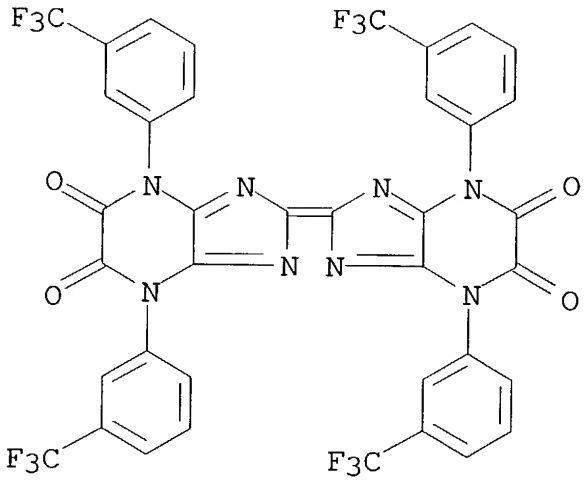
I

AB The syntheses, properties and reactions of 1,3,6,7-tetrakis(arylamino)-1,4,5,8-tetraazafulvalenes and their vinylogous derivs. are described. The acylation of form- as well as acetamidine with bis-imidoyl chlorides derived from oxalic acid formed reactive cyclic intermediates which dimerized to tetraazafulvalenes I (X = double bond) or bisvinylogous tetraazafulvalenes I [X = (CH)2]. A further synthesis was found using a cycloacylation reaction of amidines with imidoyl chlorides followed by prototropic migration of α-H. Thus, the vinylogous compd. I [X = (CH)4] and the phenylogous derivs. I (X = CHC6H4-2-CH, CHC6H4-4-CH) were isolated in moderate to good yields. Besides amidines, other carboxylic acid derivs. such as amides or thioamides were transformed into corresponding tetraazafulvalenes. Due to the vicinal amino groups, alkylation and acylation reactions were studied. For example, the reaction with orthoformates yielded ring-fused products which may be starting material for carbenes just as the cyclization product with SCCl2. Treatment of tetraazafulvalenes with anhyd. Fe(II) salts or Mo(CO)6 yielded deeply colored metal diazadiene complexes. Finally, redn. using metallic Li and subsequent alkylation constitutes a convenient synthetic entry to heterocyclic analogs of stilbene.

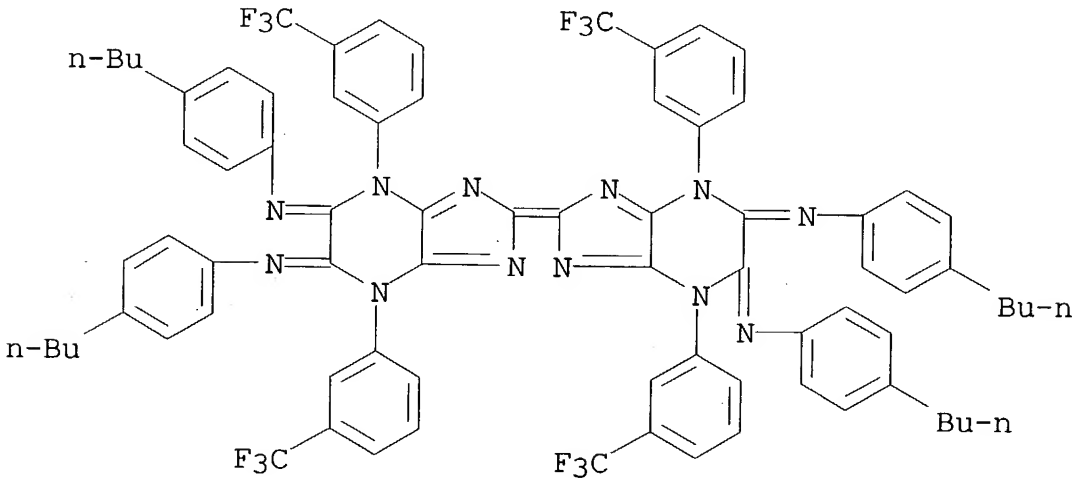
IT **210051-82-4P 210051-83-5P**
(prepn. and reactions of tetraazafulvalenes)

RN 210051-82-4 ZCAPLUS

CN 2H-Imidazo[4,5-b]pyrazine-5,6(4H,7H)-dione, 2-[4,5,6,7-tetrahydro-5,6-dioxo-4,7-bis[3-(trifluoromethyl)phenyl]-2H-imidazo[4,5-b]pyrazin-2-ylidene]-4,7-bis[3-(trifluoromethyl)phenyl]- (9CI) (CA INDEX NAME)



RN 210051-83-5 ZCAPLUS
CN Benzenamine, N,N'-[2-[5,6-bis[(4-butylphenyl)imino]-4,5,6,7-tetrahydro-4,7-bis[3-(trifluoromethyl)phenyl]-2H-imidazo[4,5-b]pyrazin-2-ylidene]-4,7-bis[3-(trifluoromethyl)phenyl]-2H-imidazo[4,5-b]pyrazine-5,6(4H,7H)-diylidene]bis[4-butyl- (9CI) (CA INDEX NAME)

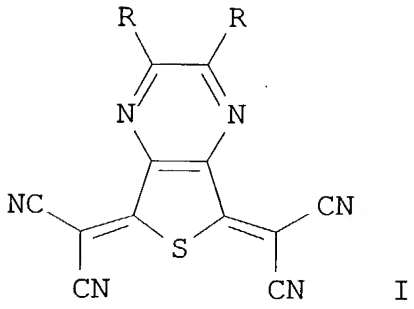


IT **210051-82-4P 210051-83-5P**
(prepn. and reactions of tetraazafulvalenes)

L18 ANSWER 6 OF 25 ZCAPLUS COPYRIGHT 2004 ACS on STN
1998:243322 Document No. 129:16100 New electron acceptors containing thieno[3,4-b]pyrazine units. Suzuki, Kazuharu; Tomura, Masaaki; Yamashita, Yoshiro (Department of Structural Molecular Science,

Grad. Univ. Adv. Studies and Inst. Mol. Sci., Okazaki, 444-8585, Japan). Journal of Materials Chemistry, 8(5), 1117-1119 (English) 1998. CODEN: JMACEP. ISSN: 0959-9428. Publisher: Royal Society of Chemistry.

GI



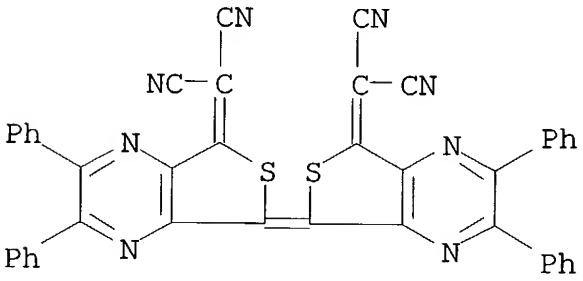
I

AB Thieno[3,4-b]pyrazines I (R = H, Ph) were prepd. as tetracyano-p-quinodimethane analogs. Crystal structures of I (R = H) were found in addn. to the UV absorption spectra and redn. potentials of I (R = H, Ph); the HOMO-LUMO gaps of I were also calcd. Crystal structures of two charge-transfer complexes of I (R = H) with tetrathiafulvalene (TTF) were found with different stoichiometries.

IT **207805-29-6P**
(prepn., UV spectra, and redn. potentials of bis(dicyanomethylene)thienopyrazines)

RN 207805-29-6 ZCAPLUS

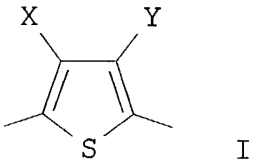
CN Propanedinitrile, [7-[7-(dicyanomethylene)-2,3-diphenylthieno[3,4-b]pyrazin-5(7H)-ylidene]-2,3-diphenylthieno[3,4-b]pyrazin-5(7H)-ylidene]- (9CI) (CA INDEX NAME)



IT **207805-29-6P**
(prepn., UV spectra, and redn. potentials of bis(dicyanomethylene)thienopyrazines)

L18 ANSWER 7 OF 25 ZCAPLUS COPYRIGHT 2004 ACS on STN
1997:734825 Document No. 128:17246 Substituted polythiophenes as nonlinear optical materials. Schrof, Wolfgang; Moehwald, Helmut; Belov, Vladimir; Mayer, Elma; van Keuren, Edward (BASF A.-G., Germany). Ger. Offen. DE 19709185 A1 19971030, 25 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1997-19709185 19970306. PRIORITY: DE 1996-19608700 19960306.

GI



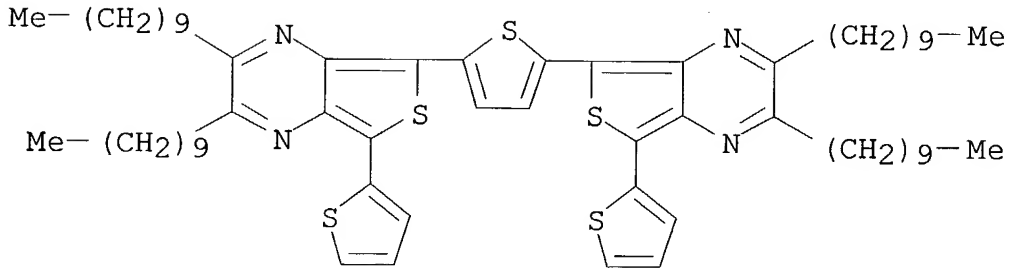
I

AB The use of polythiophenes having structural units described by the general formula I (X and Y = both H, independently selected linear or branched C1-22 alkyl, alkoxy, alkyloxyalkyl, acyl, thioacyl, acyloxy, or thioacyloxy groups, C5-8 cycloalkyl or heterocyclic groups, C6-18 aryl groups, NO2, or NHR1; R1 = independently selected from H and linear or branched C1-22 alkyl, alkoxy, alkyloxyalkyl, acyl, or thioacyl groups; with the options that the cyclic and aryl groups used for X and Y may be subsitued with ≥1 independently selected linear or branched C1-22 alkyl, alkoxy, alkyloxyalkyl, acyl, or thioacyl groups and that X and Y may form, together with the atoms to which they are bound, a C-contg. ring system which also includes ≥1 heteroatom selected from N, O, S, and P, to which further substituents may be attached) as nonlinear optical materials is described.

IT **195831-39-1P**
(substituted polythiophenes as nonlinear optical materials)

RN 195831-39-1 ZCAPLUS

CN Thieno[3,4-b]pyrazine, 5,5'-(2,5-thiophenediyl)bis[2,3-didecyl-7-(2-thienyl)- (9CI) (CA INDEX NAME)



IT **195831-39-1P**
(substituted polythiophenes as nonlinear optical materials)

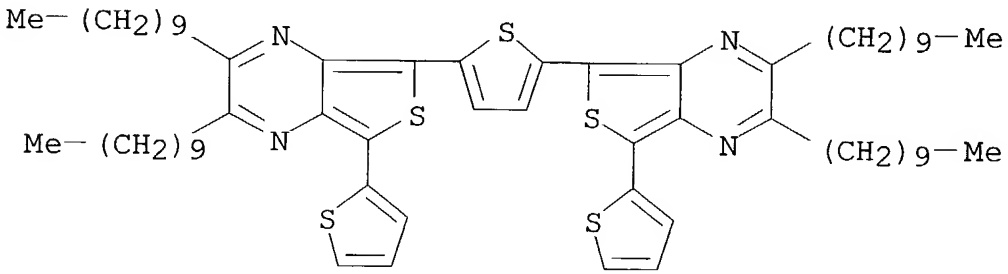
L18 ANSWER 8 OF 25 ZCAPLUS COPYRIGHT 2004 ACS on STN
1997:618132 Document No. 127:248554 Preparation and use of electrically conductive substituted polythiophenes. Mohwald, Helmut; Belov, Vladimir; Schrof, Wolfgang (BASF A.-G., Germany). PCT Int. Appl. WO 9732914 A1 19970912, 74 pp. DESIGNATED STATES: W: JP, US; RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (German). CODEN: PIXXD2. APPLICATION: WO 1997-EP1140 19970306. PRIORITY: DE 1996-19608701 19960306.

AB The title polythiophenes are prepd. from thiophene and/or thiophenes bearing specified substituents in the 4- and 4-positions. The reaction of 2,5-dibromothiophene-3,4-diamine.2HBr with 6,7-dodecanedione in the presence of Et3N in EtOH gave 39% 5,7-dibromo-2,3-dipentylthieno[3,4-b]pyrazine (I). Stirring equimolar amts. of I and 2,5-bis(trimethylstannyl)thiophene in THF contg. 5 mol% (Ph3P)2PdCl2 at 65° for 24 h gave 39% black, solid copolymer.

IT **195831-39-1P**
(prepn. of)

RN 195831-39-1 ZCAPLUS

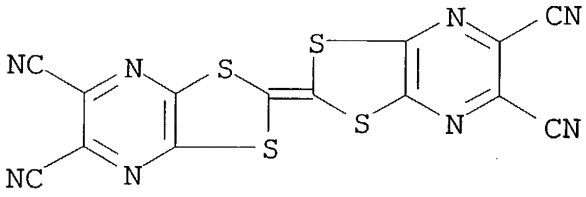
CN Thieno[3,4-b]pyrazine, 5,5'-(2,5-thiophenediyl)bis[2,3-didecyl-7-(2-thienyl)- (9CI) (CA INDEX NAME)



IT **195831-39-1P**

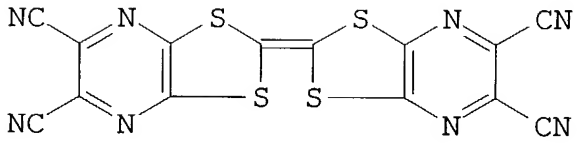
(prepn. of)

L18 ANSWER 9 OF 25 ZCAPLUS COPYRIGHT 2004 ACS on STN
1994:483371 Document No. 121:83371 Preparation of tetrathiafulvalene derivatives. Matsuoka, Masaru (Nippon Soda Co, Japan). Jpn. Kokai Tokkyo Koho JP 06065249 A2 19940308 Heisei, 4 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1992-242815 19920819.
GI For diagram(s), see printed CA Issue.
AB The title compds. [I; ring A = (un)substituted arom. hydrocarbyl, heterocyclyl, or cyclic imido; X = halo], useful as org. elec. conductive materials and nonlinear optical materials, are prepd. by cyclocondensation of cyclic compd. dihalide (II; A = same as above; X = halo) with di(carbon disulfide) salt (III; Y = alkali metal). Thus, 4 mL CS2 was added to finely cut Na metal followed by adding DMF and the resulting mixt. was reacted at 0° for 5.5 h; after 3 mL MeOH was added to decomp. excess Na metal, a soln. of 1.1. g 5,6-dichloropyrazinedicarbonitrile in DMF-MeOH was added dropwise at 0° and the resulting mixt. was reacted at ° for 15 h to give bis(dicyanopyrazino)tetrathiafulvalene (IV).
IT **155996-06-8P**, Bis(dicyanopyrazino)tetrathiafulvalene (prepn. of, as elec. conductor and nonlinear optical material)
RN 155996-06-8 ZCAPLUS
CN 1,3-Dithiolo[4,5-b]pyrazine-5,6-dicarbonitrile, 2-(5,6-dicyano-1,3-dithiolo[4,5-b]pyrazin-2-ylidene)- (9CI) (CA INDEX NAME)

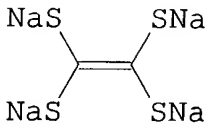


IT **155996-06-8P**, Bis(dicyanopyrazino)tetrathiafulvalene (prepn. of, as elec. conductor and nonlinear optical material)

L18 ANSWER 10 OF 25 ZCAPLUS COPYRIGHT 2004 ACS on STN
1994:457531 Document No. 121:57531 Preparation of bis(dicyanopyrazino)tetrathiafulvalene. Matsuoka, Masaru; Matsui, Nobuo (Nippon Soda Co, Japan). Jpn. Kokai Tokkyo Koho JP 06065248 A2 19940308 Heisei, 3 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1992-241342 19920818.
GI



I



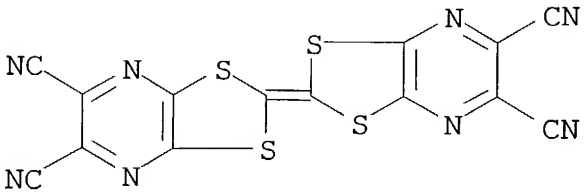
III

AB The title compd. (I), useful as a raw material for tetrapyrazinoporphyrazine deriv., condensed pigments, and org. elec. conductors, is prepd. by cyclocondensation of 5,6-dichloropyrazinecarbonitrile (II) and di(carbon disulfide) tetrasodium salt (III). Thus, 4 mL CS2 was added to finely cut Na metal followed by adding DMF and the resulting mixt. was reacted at 0° for 5.5 h; after 3 mL MeOH was added to decomp. excess Na metal, a soln. of 1.1. g II in DMF-MeOH was added dropwise at 0° and the resulting mixt. was reacted at 0° for 15 h to give I.

IT **155996-06-8P**, Bis(dicyanopyrazino)tetrathiafulvalene (prepn. of)

RN 155996-06-8 ZCAPLUS

CN 1,3-Dithiolo[4,5-b]pyrazine-5,6-dicarbonitrile, 2-(5,6-dicyano-1,3-dithiolo[4,5-b]pyrazin-2-ylidene)- (9CI) (CA INDEX NAME)



IT **155996-06-8P**, Bis(dicyanopyrazino)tetrathiafulvalene (prepn. of)

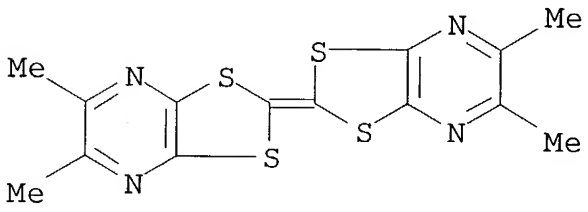
L18 ANSWER 11 OF 25 ZCAPLUS COPYRIGHT 2004 ACS on STN

1990:228033 Document No. 112:228033 Manufacture of organic functional film. Hayashida, Shoichi; Maruno, Toru; Sukegawa, Takeshi (Nippon Telegraph and Telephone Corp., Japan). Jpn. Kokai Tokkyo Koho JP 01289013 A2 19891121 Heisei, 12 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1988-116864 19880516.

AB The title manuf. comprises the steps of: (1) forming an electron-donor org. compd. film on an electrode substrate; (2) optionally, contacting or forming an electrode on the film; and (3) effecting electrolytic oxidn. of the film.

IT **114391-45-6**
(semiconductive film from, manuf. of)

RN 114391-45-6 ZCAPLUS
CN 1,3-Dithiolo[4,5-b]pyrazine, 2-(5,6-dimethyl-1,3-dithiolo[4,5-b]pyrazin-2-ylidene)-5,6-dimethyl- (9CI) (CA INDEX NAME)

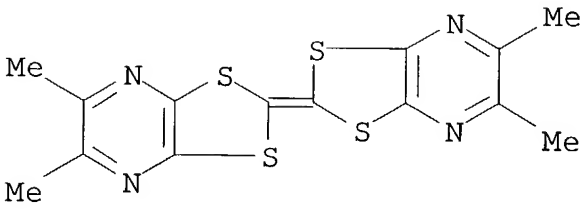


IT **114391-45-6**
(semiconductive film from, manuf. of)

L18 ANSWER 12 OF 25 ZCAPLUS COPYRIGHT 2004 ACS on STN
1988:484033 Document No. 109:84033 New series of organic metal. Radical salts of unsymmetrical donors containing pyrazino group. Kikuchi, Koichi; Kamio, Hiroyuki; Saito, Kazuya; Yiannopoulos, Stelios Y.; Papavassiliou, George C.; Kobayashi, Keiji; Ikemoto, Isao (Fac. Sci., Tokyo Metrop. Univ., Tokyo, 158, Japan). Bulletin of the Chemical Society of Japan, 61(3), 741-3 (English) 1988. CODEN: BCSJA8. ISSN: 0009-2673.
AB The I3, ClO4, and PF6 salts of unsym. donors contg. fused pyrazino groups (DMPDSDTF and DM(DMP)DSDTF) were prepd. electrochem. and their elec. conductivities were measured. The I3 salt of DM(DMP)DSDTF exhibited a metallic behavior down to .apprx.120 K. The radical salts of unsym. donors showed much larger conductivities than those of the corresponding sym. donors contg. pyrazino groups.
IT **115525-01-4**
(elec. cond. and band gap energy of)
RN 115525-01-4 ZCAPLUS
CN 1,3-Dithiolo[4,5-b]pyrazine, 2-(5,6-dimethyl-1,3-dithiolo[4,5-b]pyrazin-2-ylidene)-5,6-dimethyl-, radical ion(1+), hexafluorophosphate(1-), compd. with 2-(5,6-dimethyl-1,3-dithiolo[4,5-b]pyrazin-2-ylidene)-5,6-dimethyl-1,3-dithiolo[4,5-b]pyrazine (1:1) (9CI) (CA INDEX NAME)

CM 1

CRN 114391-45-6
CMF C14 H12 N4 S4

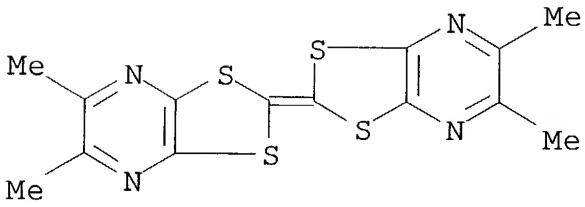


CM 2

CRN 115525-00-3
CMF C14 H12 N4 S4 . F6 P

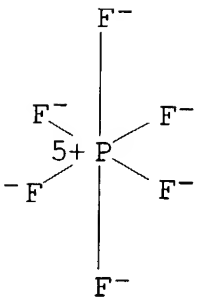
CM 3

CRN 102567-24-8
CMF C14 H12 N4 S4
CCI RIS



CM 4

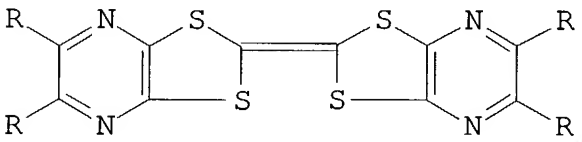
CRN 16919-18-9
CMF F6 P
CCI CCS



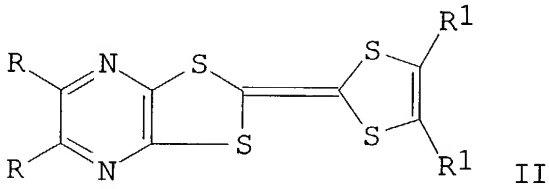
IT **115525-01-4**
(elec. cond. and band gap energy of)

L18 ANSWER 13 OF 25 ZCAPLUS COPYRIGHT 2004 ACS on STN
1988:204589 Document No. 108:204589 Bis(pyrazino)tetrathiafulvalene and similar π-donors. Papavassiliou, G. C.; Yiannopoulos, S. Y.; Zambounis, J. S. (Theor. Phys. Chem. Inst., Natl. Hell. Res. Found., Athens, 116/35, Greece). Chemica Scripta, 27(2), 265-8 (English) 1987. CODEN: CSRPB9. ISSN: 0004-2056. OTHER SOURCES: CASREACT 108:204589.

GI



I



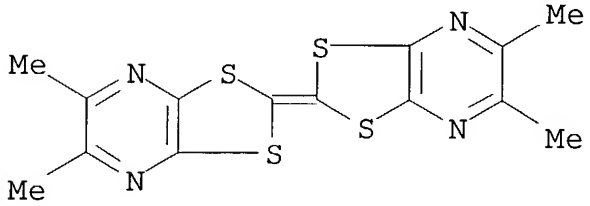
II

AB Sym. and unsym. tetrathiafulvalenes I (R = H, Me; 2R = CH:CHCH:CH, CH:CMeCMe:CH, N:CHCH:CH) and II (R1 = Me; 2R1 = CH2, CH2CH2, CH2CH2CH2, CHMeCH2) were prepd. by coupling and cross-coupling of the corresponding dithiolethiones with P(OEt)3. Charge-transfer complexes of I and II with Br, Bu4NX (X = Br, I3, Br2I), and TCNQ were also prepd.

IT **114391-45-6P**
(prepn. and charge-transfer complex formation of)

RN 114391-45-6 ZCAPLUS

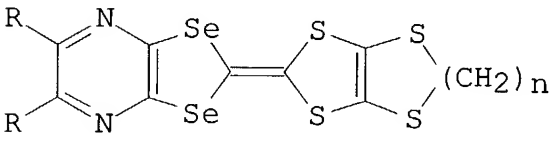
CN 1,3-Dithiolo[4,5-b]pyrazine, 2-(5,6-dimethyl-1,3-dithiolo[4,5-b]pyrazin-2-ylidene)-5,6-dimethyl- (9CI) (CA INDEX NAME)



IT **114391-45-6P**
(prepn. and charge-transfer complex formation of)

L18 ANSWER 14 OF 25 ZCAPLUS COPYRIGHT 2004 ACS on STN
1988:94505 Document No. 108:94505 Synthesis of pyrazinodithiadiselenafulvalenes. New unsymmetrical π-donors. Papavassiliou, George C.; Yiannopoulos, Stelios Y.; Zambounis, John S.; Kobayashi, Keiji; Umemoto, Kisaburo (Theor. Phys. Chem. Inst., Natl. Hellenic Res. Found., Athens, 116/35, Greece). Chemistry Letters (7), 1279-83 (English) 1987. CODEN: CMLTAG. ISSN: 0366-7022. OTHER SOURCES: CASREACT 108:94505.

GI



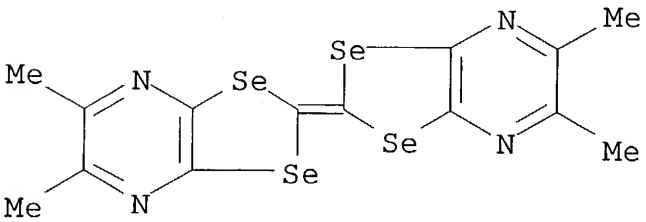
I

AB Unsym. dithiadiselenafulvalenes, e.g., I (R = H, Me; n = 1, 2) which are annelated on the 1,3-dithiole or 1,3-diselenole moiety to a 1,4-pyrazine ring, were prepd. by the cross coupling reaction and characterized as electron-donors for use in conductive charge-transfer salts. Redox potentials of I are reported.

IT **113003-75-1P**
(attempted prepn. of, by self-coupling reaction)

RN 113003-75-1 ZCAPLUS

CN 1,3-Diselenolo[4,5-b]pyrazine, 2-(5,6-dimethyl-1,3-diselenolo[4,5-b]pyrazin-2-ylidene)-5,6-dimethyl- (9CI) (CA INDEX NAME)



IT **113003-75-1P**
(attempted prepn. of, by self-coupling reaction)

L18 ANSWER 15 OF 25 ZCAPLUS COPYRIGHT 2004 ACS on STN
1987:496615 Document No. 107:96615 Nitrogen-containing

tetrathiafulvalenes and a few of their charge transfer complexes. Papavassiliou, G. C.; Yiannopoulos, S. Y.; Zambounis, J. S. (Theor. Phys. Chem. Inst., Natl. Hell. Res. Found., Athens, 116/35, Greece). Physica B+C: Physics of Condensed Matter + Atomic, Molecular and Plasma Physics, Optics (Amsterdam), 143(1-3), 310-12 (English) 1986. CODEN: PHBCDQ. ISSN: 0378-4363.

AB The prepn. of sym. and unsym. tetrathiafulvalenes contg. at least one pyrazino-, pyridino-, or similar rings with N heteroatoms is briefly described. Also the prepn. of a no. of their charge-transfer complexes of the type DmXn (where D = donor: tetrathiafulvalene, X = Br3, IBr2, I2Br, AuI2, I3, BF4, PF6, ClO4, ReO4, TCNQ) and preliminary results on their structural, elec. and optical properties are reported.

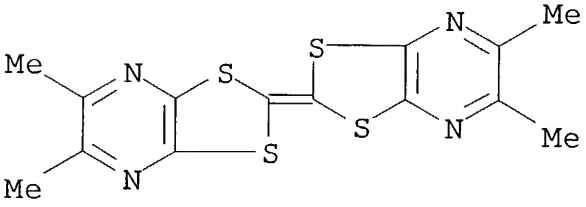
IT **102567-25-9P 109949-28-2P**
(prepn. of)

RN 102567-25-9 ZCAPLUS

CN Iodate(1-), dibromo-, salt with 2-(5,6-dimethyl-1,3-dithiolo[4,5-b]pyrazin-2-ylidene)-5,6-dimethyl-1,3-dithiolo[4,5-b]pyrazine (1:1) (9CI) (CA INDEX NAME)

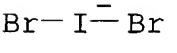
CM 1

CRN 102567-24-8
CMF C14 H12 N4 S4
CCI RIS



CM 2

CRN 14791-49-2
CMF Br2 I



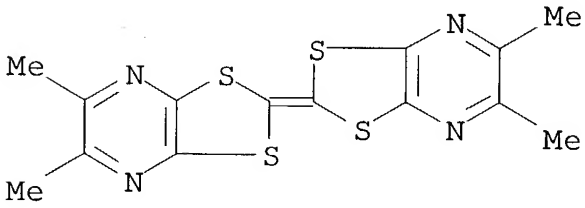
RN 109949-28-2 ZCAPLUS

CN Iodide (I31-), salt with 2-(5,6-dimethyl-1,3-dithiolo[4,5-b]pyrazin-

2-ylidene)-5,6-dimethyl-1,3-dithiolo[4,5-b]pyrazine (1:1) (9CI) (CA INDEX NAME)

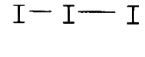
CM 1

CRN 102567-24-8
CMF C14 H12 N4 S4
CCI RIS



CM 2

CRN 14900-04-0
CMF I3



IT **102567-25-9P 109949-28-2P**
(prepn. of)

L18 ANSWER 16 OF 25 ZCAPLUS COPYRIGHT 2004 ACS on STN
1986:233163 Document No. 104:233163 Optical properties of bis(pyrazino)tetrathiafulvalene salts. Papavassiliou, G. C.; Geserich, H. P.; Yiannopoulos, S. Y.; Zambounis, J. S. (Theor. Phys. Chem. Inst., Natl. Hellenic Res. Found., Athens, 116 35, Greece). Journal of Molecular Structure, 143, 215-18 (English) 1986. CODEN: JMOSB4. ISSN: 0022-2860.

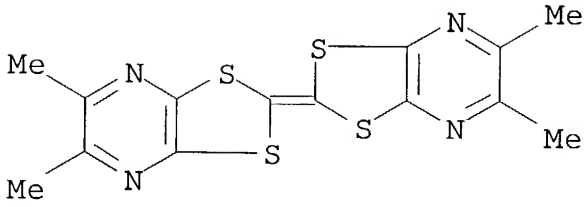
AB The optical reflectance and absorption spectra of (BPTTF)2BF4 [where BPTTF is bis(pyrazino)tetrathiafulvalene] and similar salts are reported for a wide spectral region.

IT **102567-25-9**
(optical properties of)

RN 102567-25-9 ZCAPLUS
CN Iodate(1-), dibromo-, salt with 2-(5,6-dimethyl-1,3-dithiolo[4,5-b]pyrazin-2-ylidene)-5,6-dimethyl-1,3-dithiolo[4,5-b]pyrazine (1:1) (9CI) (CA INDEX NAME)

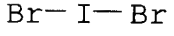
CM 1

CRN 102567-24-8
CMF C14 H12 N4 S4
CCI RIS



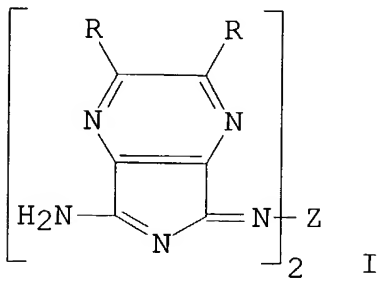
CM 2

CRN 14791-49-2
CMF Br2 I



IT **102567-25-9**
(optical properties of)

L18 ANSWER 17 OF 25 ZCAPLUS COPYRIGHT 2004 ACS on STN
1980:95632 Document No. 92:95632 Bispyrrolopyrazine derivatives. Genda, Yoshikazu; Tomita, Nobuo; Ito, Masaru; Kano, Saburo (Nippon Soda Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 54119531 19790917 Showa, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1978-27474 19780310.
GI



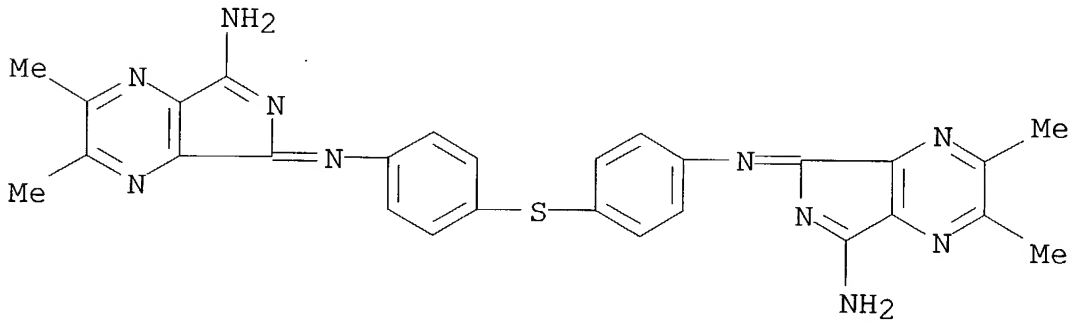
I

AB Pigments I (R = H, Me; Z = arom. and heterocyclic residue) with excellent lightfastness in coatings and inks were prepd. For example, 7,7-dimethoxy-5-imino-5H-pyrrolo[3,4-b]pyrazine [72724-46-0] and 3,3'-dichlorobenzidine [91-94-1] in MeOH were heated under reflux for 15 h to give 83.2% orange-yellow I (R = H, Z = 3,3'-dichlorobiphenyl-4,4'-diyl) [72724-45-9].

IT **72724-50-6P 72724-53-9P 72724-54-0P**
72724-55-1P 72724-58-4P 72724-60-8P
72724-63-1P 72724-65-3P 72724-67-5P
72724-68-6P
(pigments, lightfast, for coatings and inks, manuf. of)

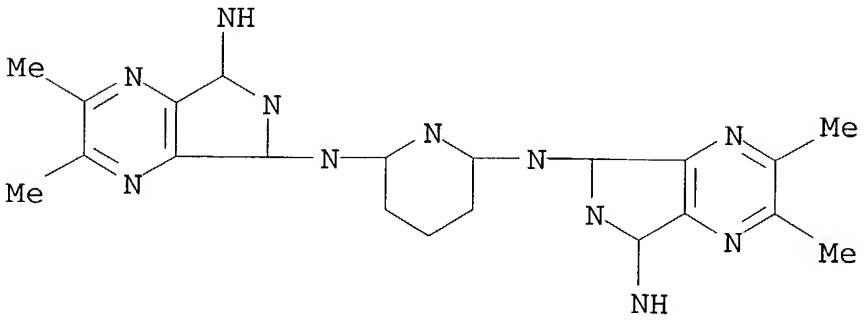
RN 72724-50-6 ZCAPLUS

CN 5H-Pyrrolo[3,4-b]pyrazin-7-amine, N,N'-(thiodi-4,1-phenylene)bis[5-imino-2,3-dimethyl- (9CI) (CA INDEX NAME)



RN 72724-53-9 ZCAPLUS

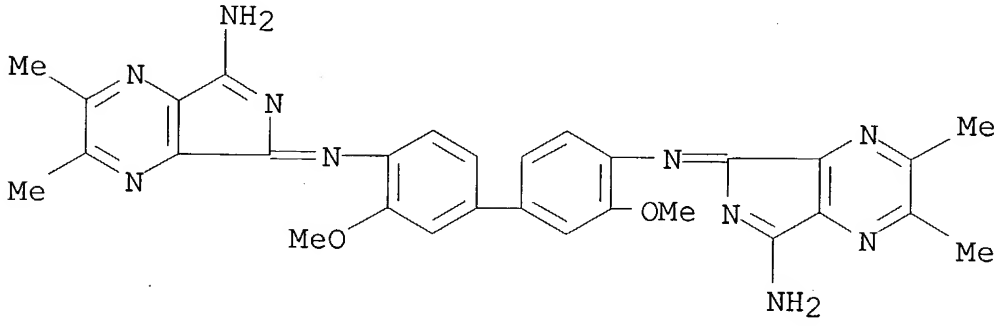
CN 2,6-Pyridinediamine, N,N'-bis(7-amino-2,3-dimethyl-5H-pyrrolo[3,4-b]pyrazin-5-ylidene)- (9CI) (CA INDEX NAME)



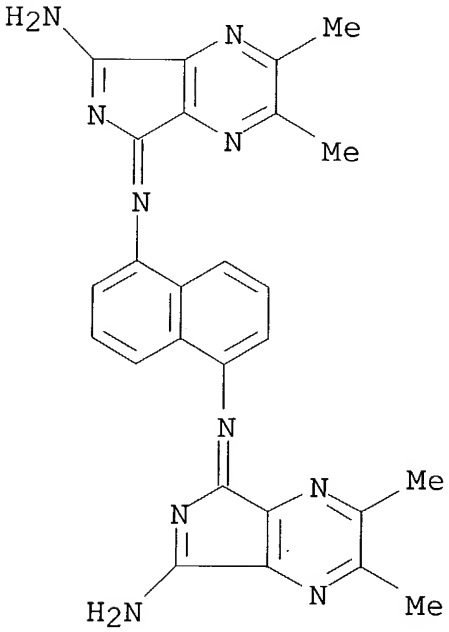
*** FRAGMENT DIAGRAM IS INCOMPLETE ***

RN 72724-54-0 ZCAPLUS

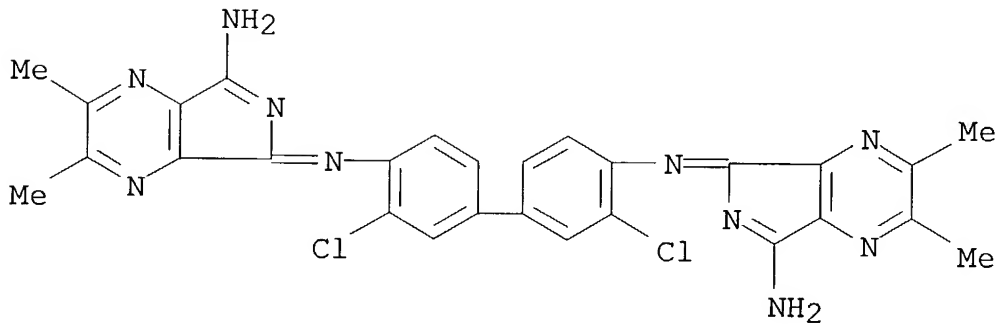
CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-bis(7-amino-2,3-dimethyl-5H-pyrrolo[3,4-b]pyrazin-5-ylidene)-3,3'-dimethoxy- (9CI) (CA INDEX NAME)



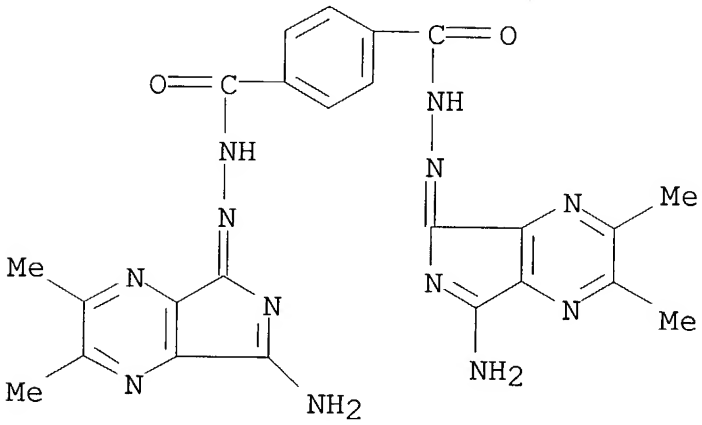
RN 72724-55-1 ZCAPLUS
CN 1,5-Naphthalenediamine, N,N'-bis(7-amino-2,3-dimethyl-5H-pyrrolo[3,4-b]pyrazin-5-ylidene)- (9CI) (CA INDEX NAME)



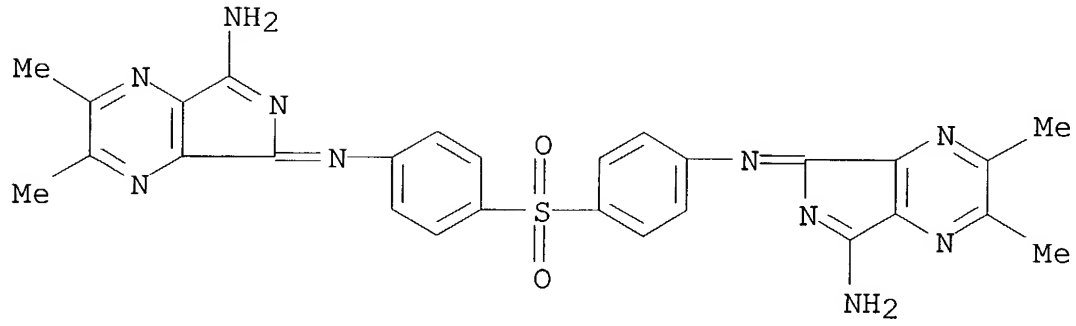
RN 72724-58-4 ZCAPLUS
CN [1,1'-Biphenyl]-4,4'-diamine, N,N'-bis(7-amino-2,3-dimethyl-5H-pyrrolo[3,4-b]pyrazin-5-ylidene)-3,3'-dichloro- (9CI) (CA INDEX NAME)



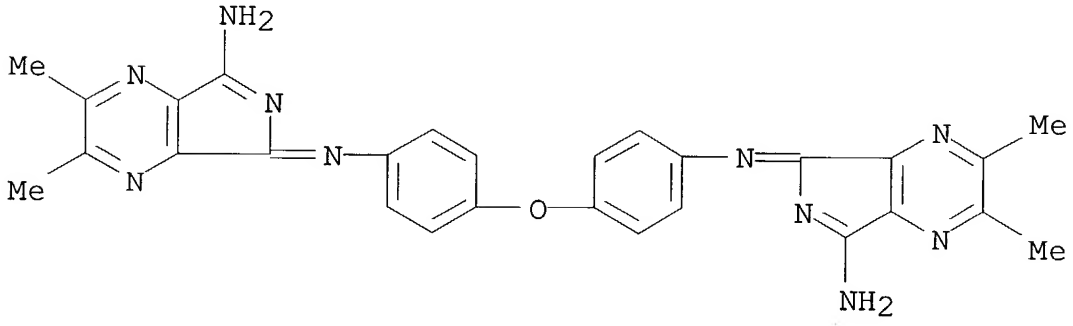
RN 72724-60-8 ZCAPLUS
CN 1,4-Benzenedicarboxylic acid, bis[(7-amino-2,3-dimethyl-5H-pyrrolo[3,4-b]pyrazin-5-ylidene)hydrazide] (9CI) (CA INDEX NAME)



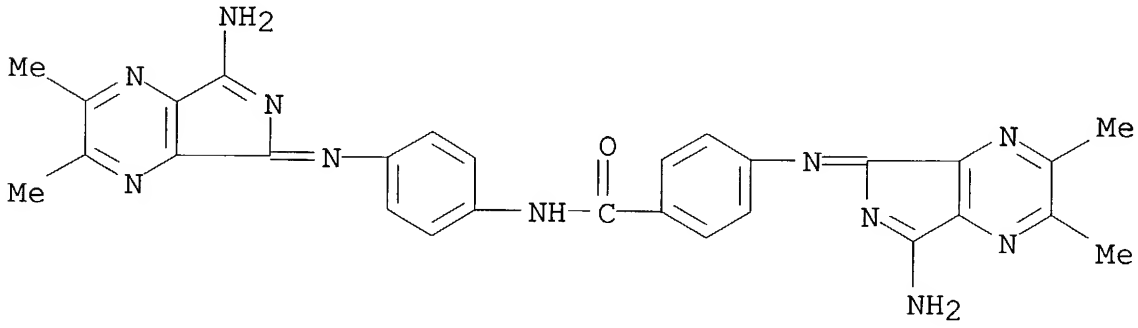
RN 72724-63-1 ZCAPLUS
CN 5H-Pyrrolo[3,4-b]pyrazin-7-amine, N,N'-(sulfonyldi-4,1-phenylene)bis[5-imino-2,3-dimethyl- (9CI) (CA INDEX NAME)



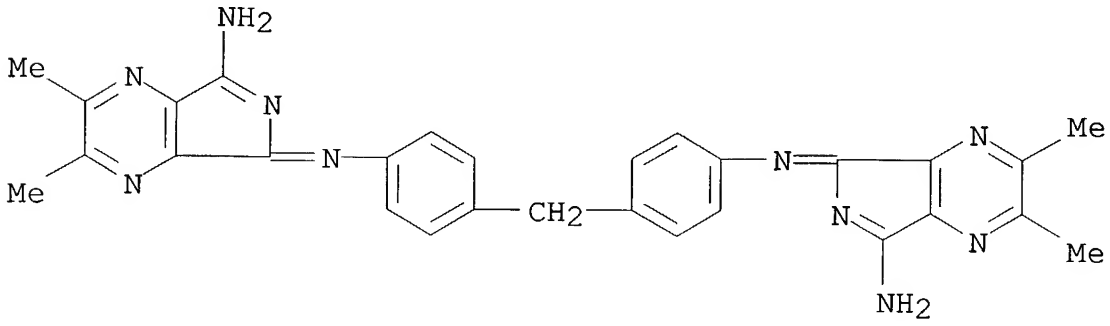
RN 72724-65-3 ZCAPLUS
CN 5H-Pyrrolo[3,4-b]pyrazin-7-amine, N,N'-(oxydi-4,1-phenylene)bis[5-imino-2,3-dimethyl- (9CI) (CA INDEX NAME)



RN 72724-67-5 ZCAPLUS
CN Benzamide, 4-[(7-amino-2,3-dimethyl-5H-pyrrolo[3,4-b]pyrazin-5-ylidene)amino]-N-[4-[(7-amino-2,3-dimethyl-5H-pyrrolo[3,4-b]pyrazin-5-ylidene)amino]phenyl]- (9CI) (CA INDEX NAME)

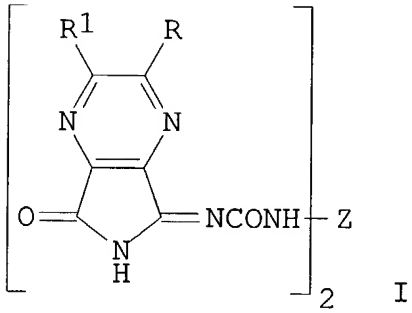


RN 72724-68-6 ZCAPLUS
CN 5H-Pyrrolo[3,4-b]pyrazin-7-amine, N,N'-(methylenedi-4,1-phenylene)bis[5-imino-2,3-dimethyl- (9CI) (CA INDEX NAME)



IT **72724-50-6P 72724-53-9P 72724-54-0P**
72724-55-1P 72724-58-4P 72724-60-8P
72724-63-1P 72724-65-3P 72724-67-5P
72724-68-6P
(pigments, lightfast, for coatings and inks, manuf. of)

L18 ANSWER 18 OF 25 ZCAPLUS COPYRIGHT 2004 ACS on STN
1980:43274 Document No. 92:43274 Pyrrolopyrazine pigments. Genda, Yoshikazu; Tomita, Nobuo; Ito, Masaru (Nippon Soda Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 54083026 19790702 Showa, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1977-150280 19771214.
GI



AB I (R, R1 = H, Me, furyl, phenyl; Z = arom. carbocyclic residue) useful as light- and solvent-fast pigments in coatings and inks were prepd. For example, 7-amino-2,3-diphenyl-5-oxopyrrolo[3,4-

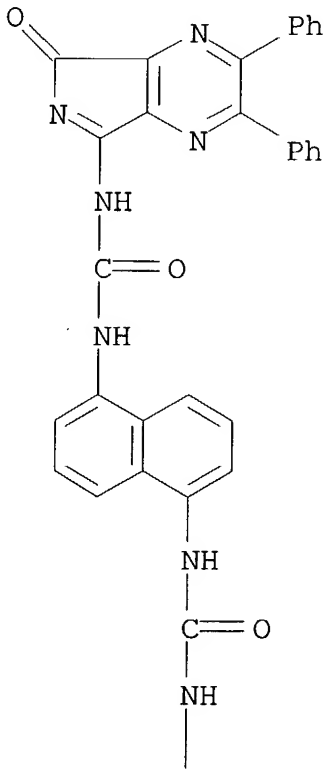
b]pyrazine [70385-89-6] was treated with 1,5-naphthalene diisocyanate [3173-72-6] to give I (R = R1 = Ph, Z = 1,5-C10H6) [72362-68-6].

IT **72362-68-6P 72362-73-3P 72362-75-5P**
72362-76-6P 72362-77-7P 72362-78-8P
72362-79-9P 72362-80-2P 72362-82-4P
72362-83-5P 72362-84-6P 72362-85-7P
72362-86-8P 72362-87-9P 72362-88-0P
72362-89-1P 72368-05-9P
(pigments, light- and solvent-resistant, for coatings and inks, manuf. of)

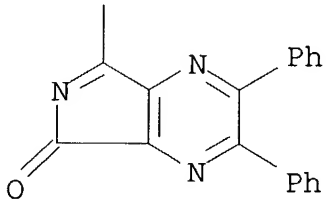
RN 72362-68-6 ZCAPLUS

CN Urea, N,N''-1,5-naphthalenediylbis[N'-(1-oxo-5,6-diphenyl-1H-pyrrolo[3,4-b]pyrazin-3-yl)- (9CI) (CA INDEX NAME)

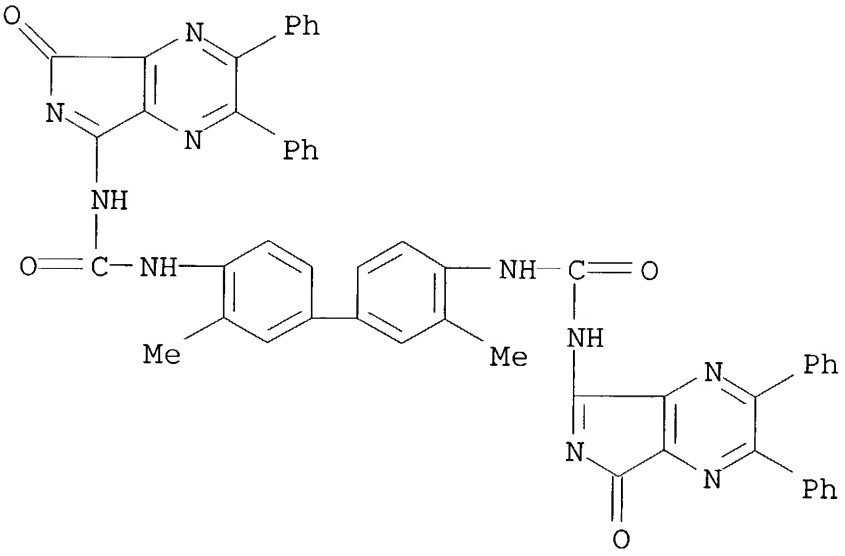
PAGE 1-A



PAGE 2-A

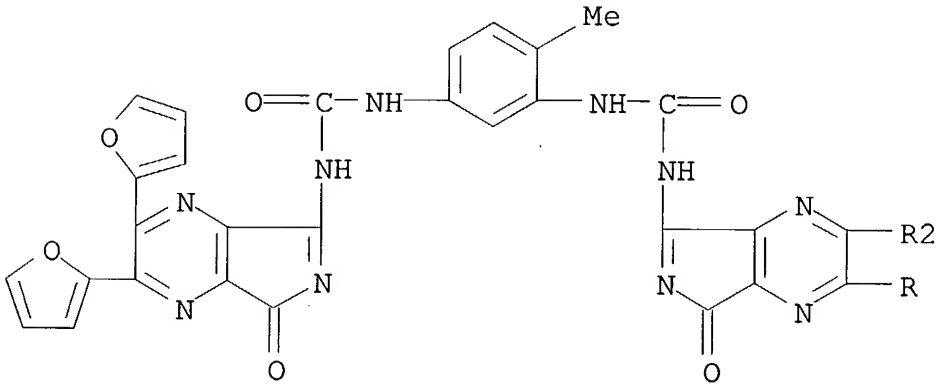


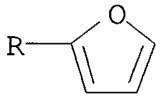
RN 72362-73-3 ZCAPLUS
CN Urea, N,N''-(3,3'-dimethyl[1,1'-biphenyl]-4,4'-diyl)bis[N'-(1-oxo-5,6-diphenyl-1H-pyrrolo[3,4-b]pyrazin-3-yl)- (9CI) (CA INDEX NAME)



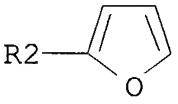
RN 72362-75-5 ZCAPLUS
CN Urea, N,N''-(4-methyl-1,3-phenylene)bis[N'-(5,6-di-2-furanyl-1-oxo-1H-pyrrolo[3,4-b]pyrazin-3-yl)- (9CI) (CA INDEX NAME)

PAGE 1-A



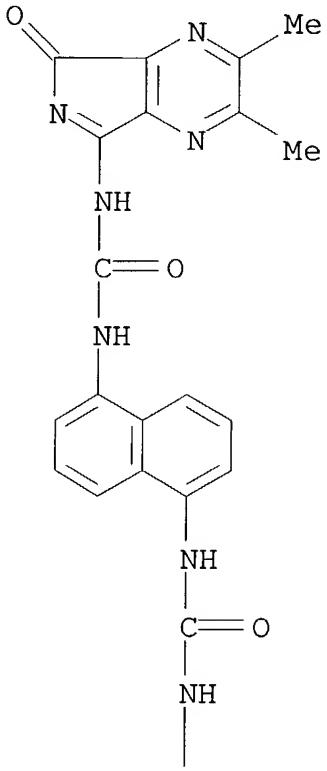


PAGE 2-A

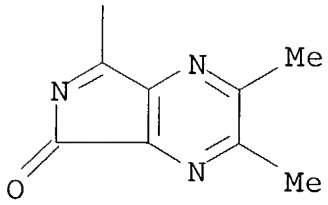


RN 72362-76-6 ZCAPLUS
CN Urea, N,N''-1,5-naphthalenediylbis[N'-(5,6-dimethyl-1-oxo-1H-pyrrolo[3,4-b]pyrazin-3-yl)- (9CI) (CA INDEX NAME)

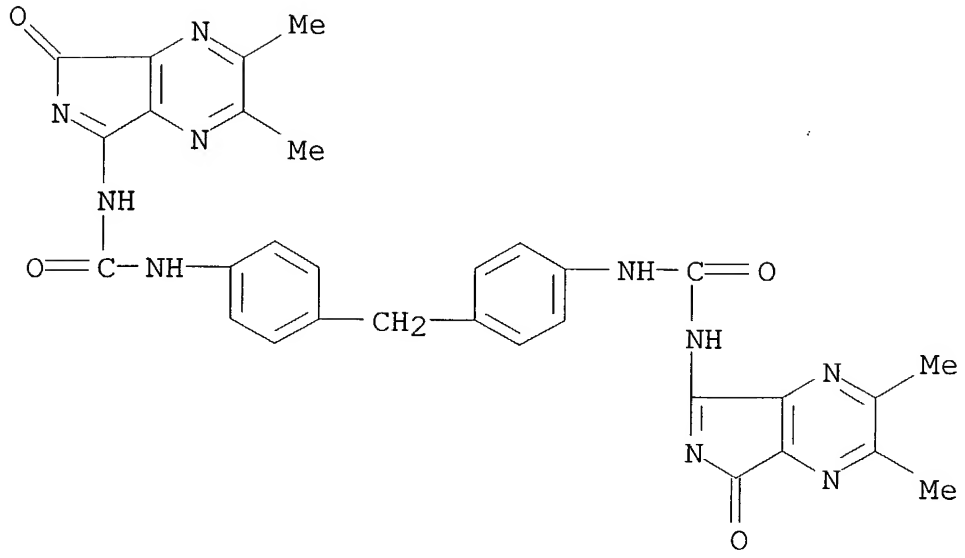
PAGE 1-A



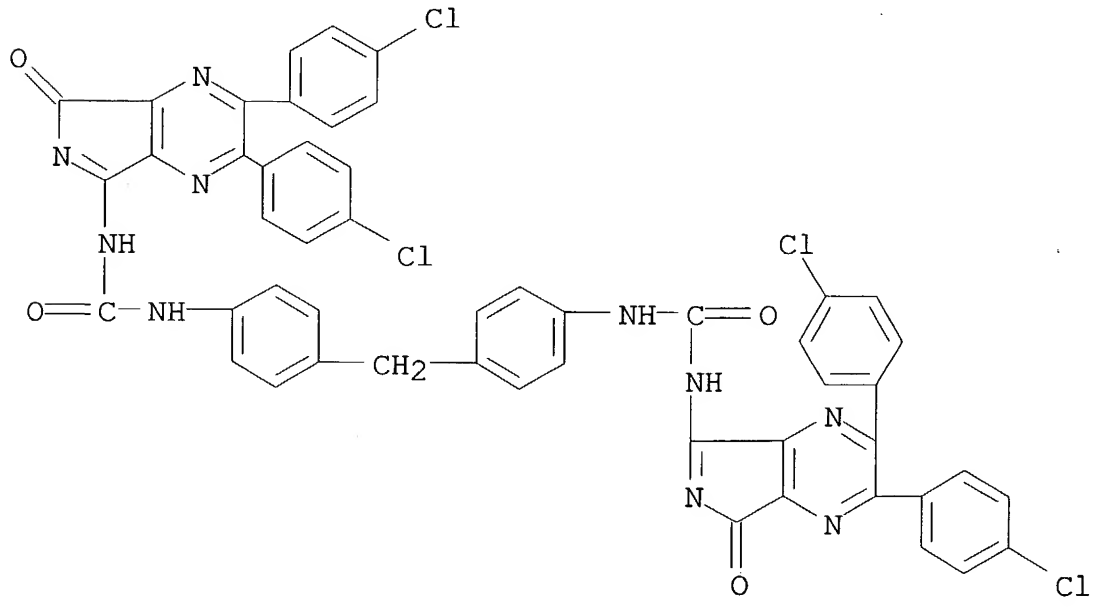
PAGE 2-A



RN 72362-77-7 ZCAPLUS
CN Urea, N,N''-(methylenedi-4,1-phenylene)bis[N'-(5,6-dimethyl-1-oxo-1H-pyrrolo[3,4-b]pyrazin-3-yl)- (9CI) (CA INDEX NAME)

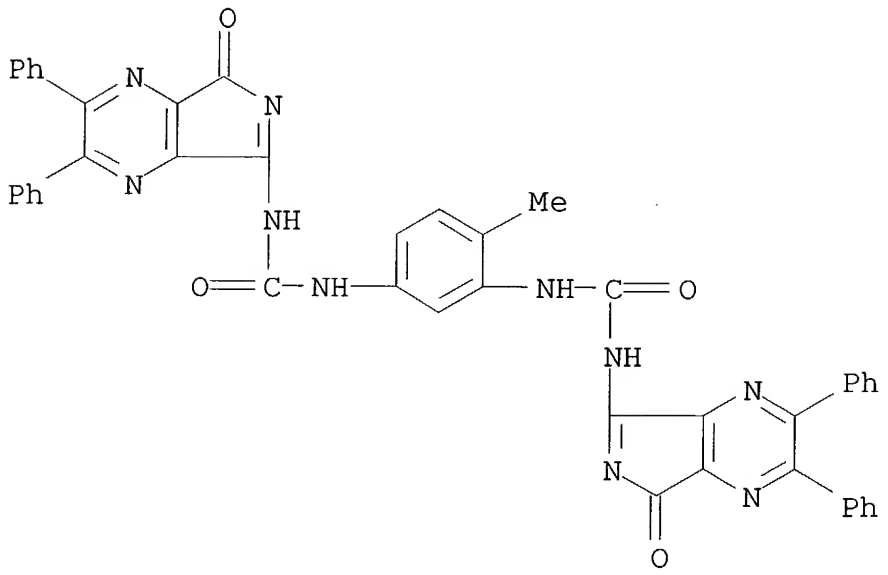


RN 72362-78-8 ZCAPLUS
CN Urea, N,N''-(methylenedi-4,1-phenylene)bis[N'-[5,6-bis(4-chlorophenyl)-1-oxo-1H-pyrrolo[3,4-b]pyrazin-3-yl]- (9CI) (CA INDEX NAME)

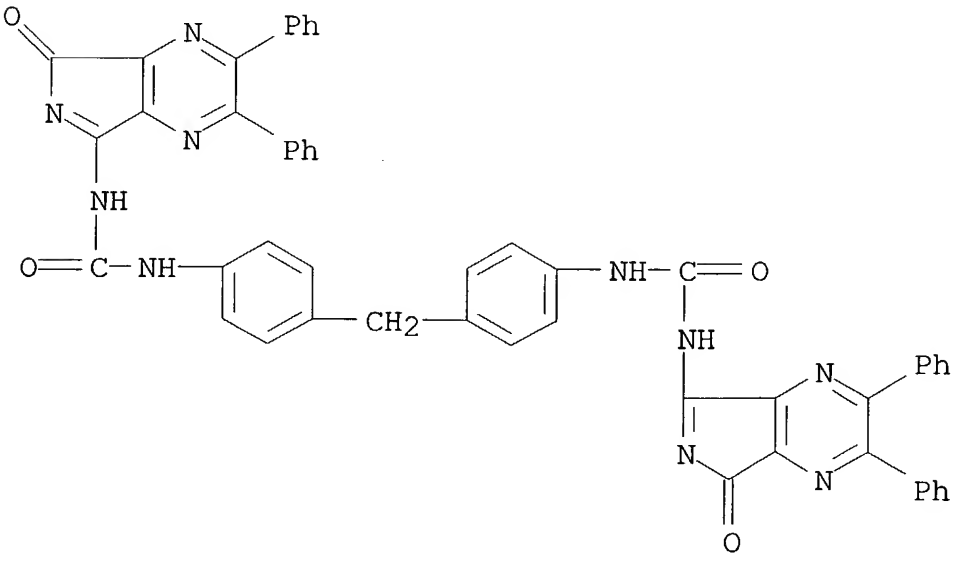


RN 72362-79-9 ZCAPLUS
CN Urea, N,N''-(4-methyl-1,3-phenylene)bis[N'-(1-oxo-5,6-diphenyl-1H-

pyrrolo[3,4-b]pyrazin-3-yl)- (9CI) (CA INDEX NAME)

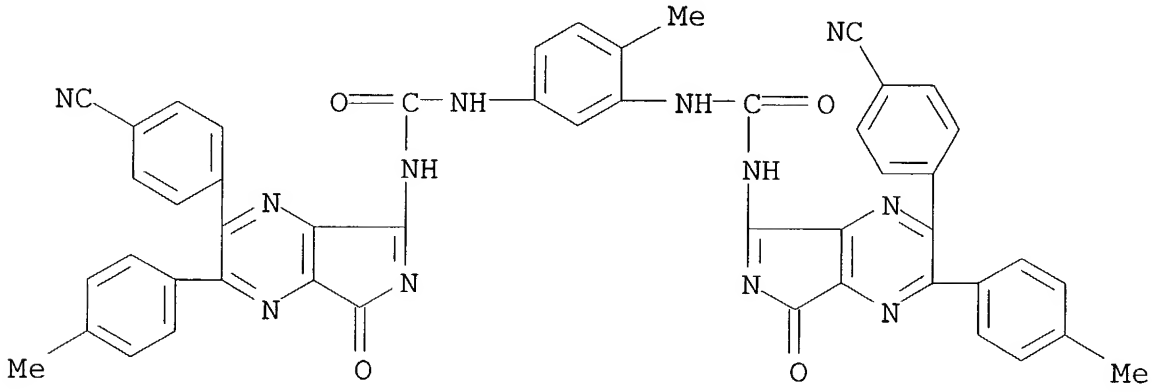


RN 72362-80-2 ZCAPLUS
CN Urea, N,N''-(methylenedi-4,1-phenylene)bis[N'-(1-oxo-5,6-diphenyl-1H-pyrrolo[3,4-b]pyrazin-3-yl)- (9CI) (CA INDEX NAME)

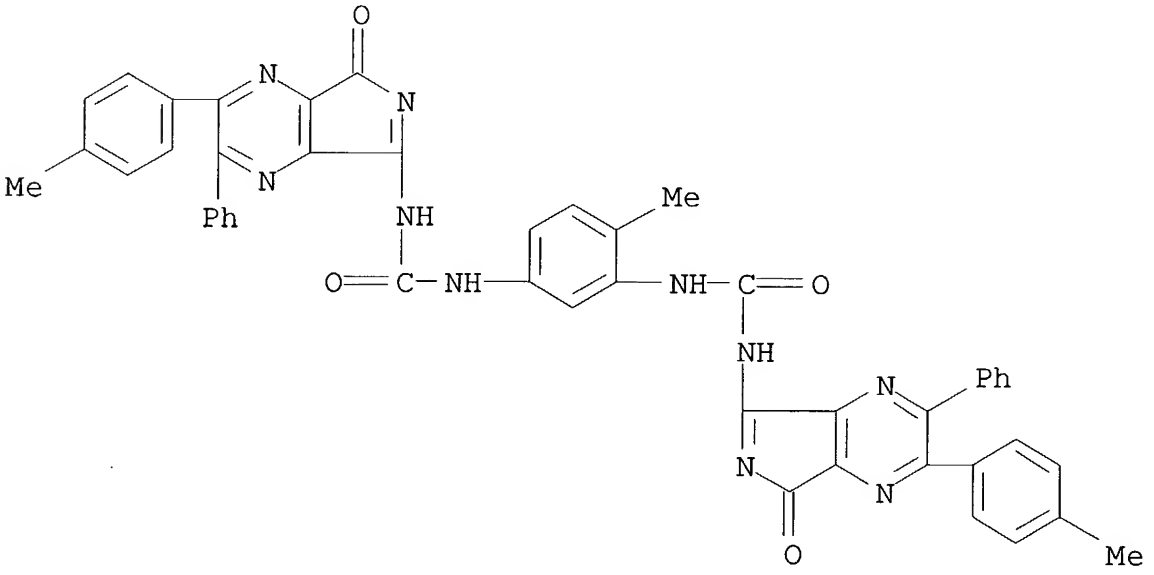


RN 72362-82-4 ZCAPLUS
CN Urea, N,N''-(4-methyl-1,3-phenylene)bis[N'-[5-(4-cyanophenyl)-6-(4-

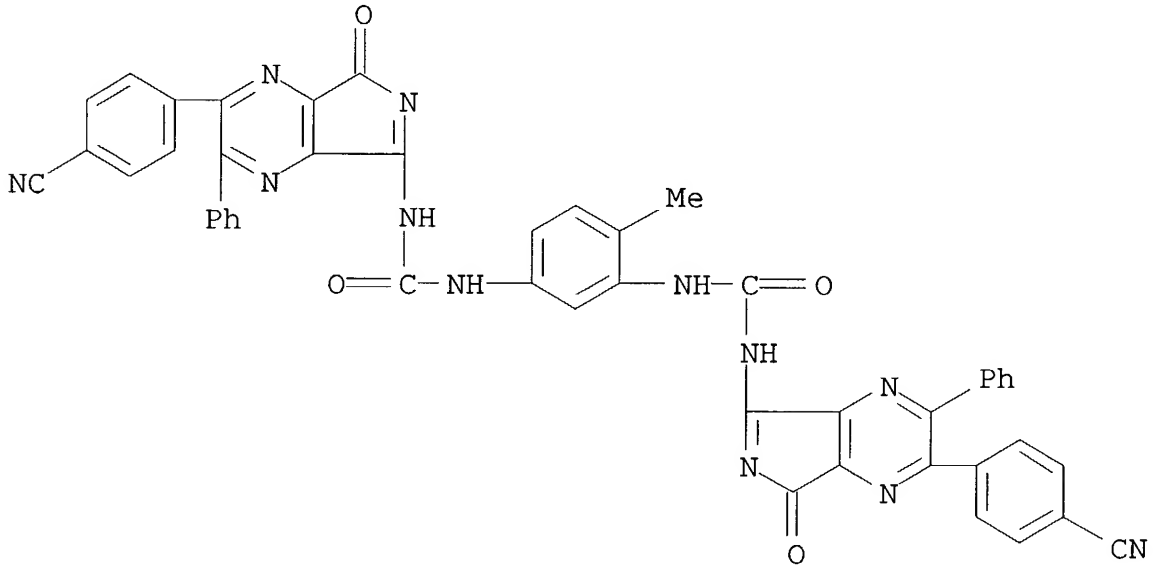
methylphenyl)-1-oxo-1H-pyrrolo[3,4-b]pyrazin-3-yl]- (9CI) (CA INDEX NAME)



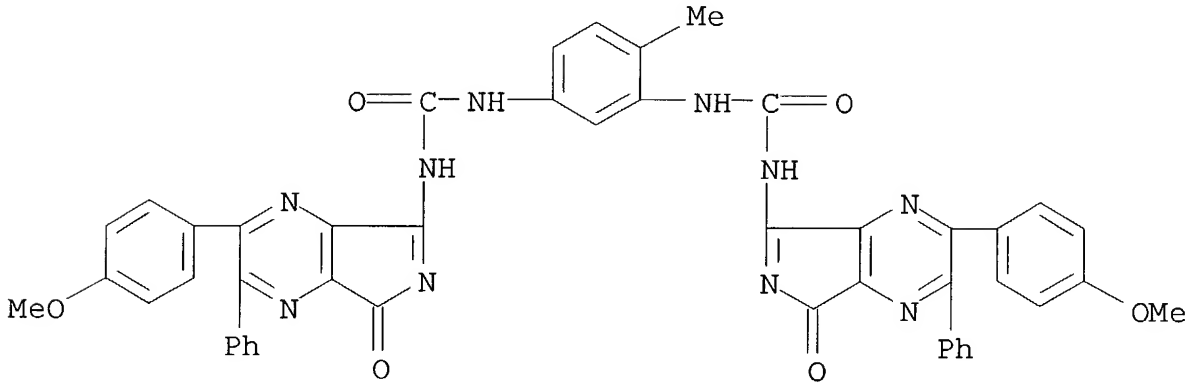
RN 72362-83-5 ZCAPLUS
CN Urea, N,N''-(4-methyl-1,3-phenylene)bis[N'-[6-(4-methylphenyl)-1-oxo-5-phenyl-1H-pyrrolo[3,4-b]pyrazin-1-yl]- (9CI) (CA INDEX NAME)



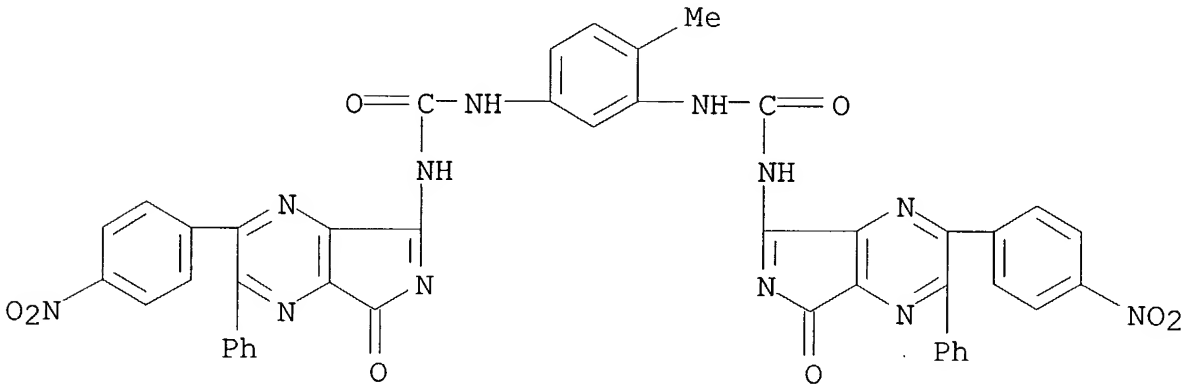
RN 72362-84-6 ZCAPLUS
CN Urea, N,N''-(4-methyl-1,3-phenylene)bis[N'-[6-(4-cyanophenyl)-1-oxo-5-phenyl-1H-pyrrolo[3,4-b]pyrazin-3-yl]- (9CI) (CA INDEX NAME)



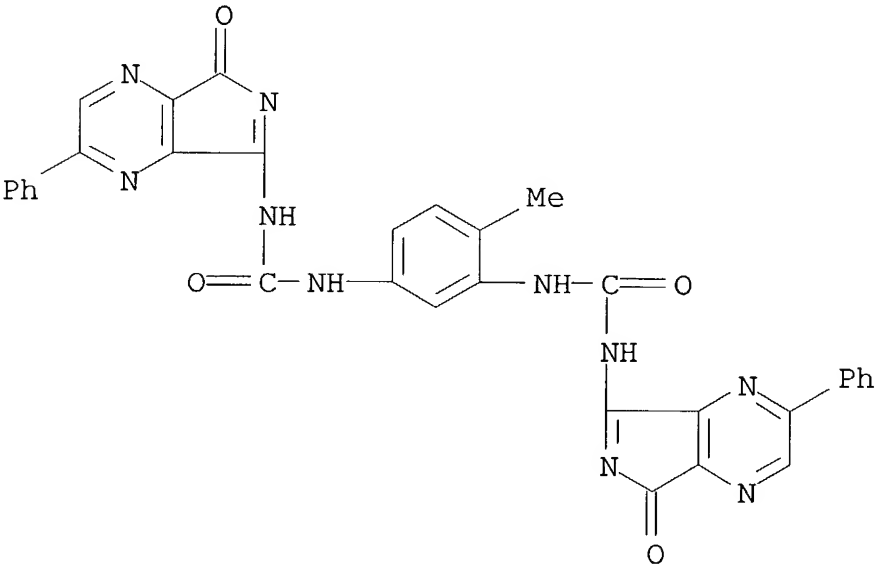
RN 72362-85-7 ZCAPLUS
CN Urea, N,N''-(4-methyl-1,3-phenylene)bis[N'-[5-(4-methoxyphenyl)-1-oxo-6-phenyl-1H-pyrrolo[3,4-b]pyrazin-3-yl]- (9CI) (CA INDEX NAME)



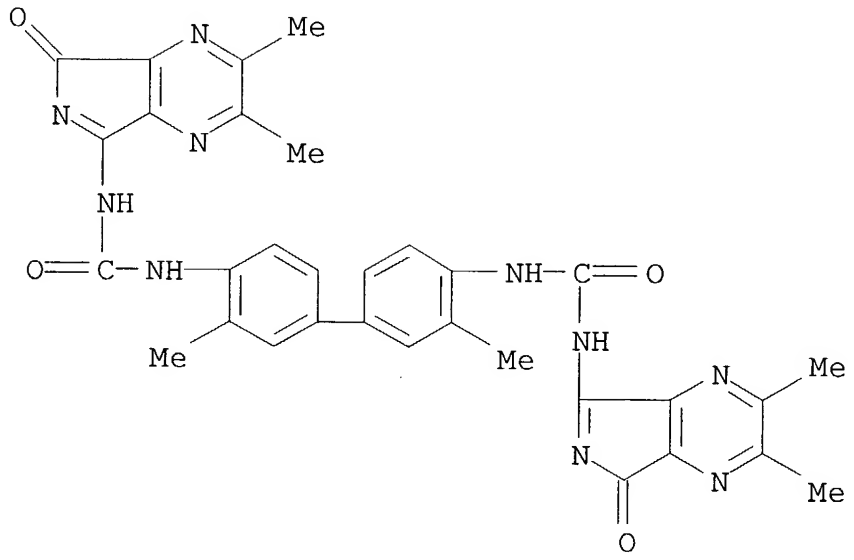
RN 72362-86-8 ZCAPLUS
CN Urea, N,N''-(4-methyl-1,3-phenylene)bis[N'-[5-(4-nitrophenyl)-1-oxo-6-phenyl-1H-pyrrolo[3,4-b]pyrazin-3-yl]- (9CI) (CA INDEX NAME)



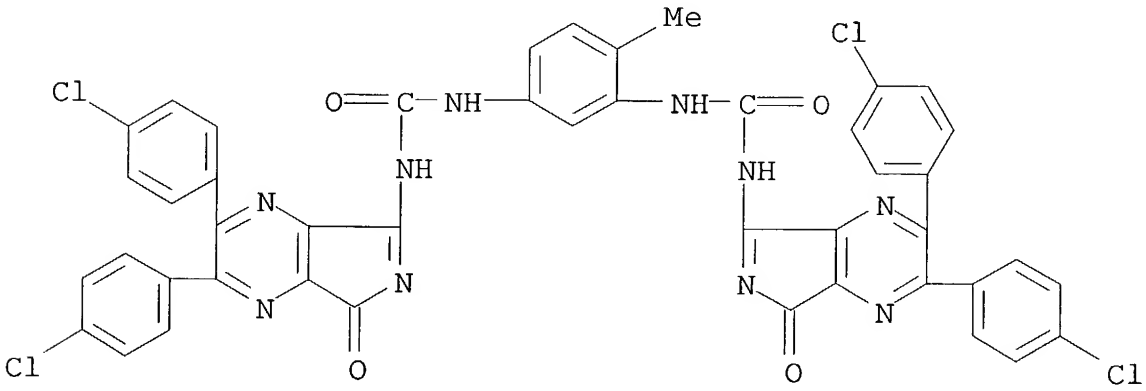
RN 72362-87-9 ZCAPLUS
CN Urea, N,N''-(4-methyl-1,3-phenylene)bis[N'-(1-oxo-5-phenyl-1H-pyrrolo[3,4-b]pyrazin-3-yl)- (9CI) (CA INDEX NAME)



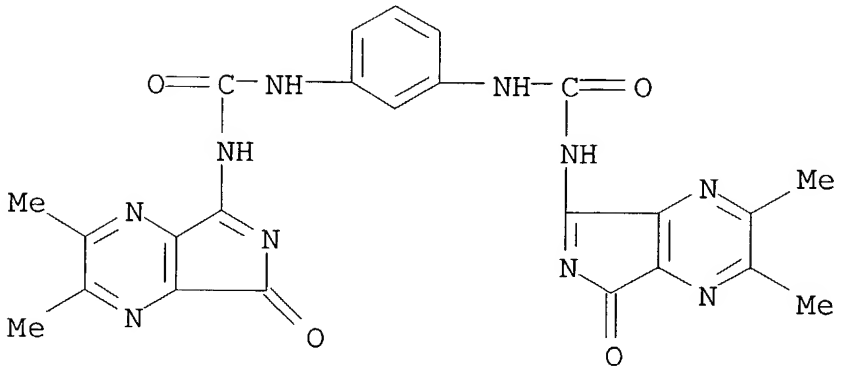
RN 72362-88-0 ZCAPLUS
CN Urea, N,N''-(3,3'-dimethyl[1,1'-biphenyl]-4,4'-diyl)bis[N'-(5,6-dimethyl-1-oxo-1H-pyrrolo[3,4-b]pyrazin-3-yl)- (9CI) (CA INDEX NAME)



RN 72362-89-1 ZCAPLUS
CN Urea, N,N''-(4-methyl-1,3-phenylene)bis[N'-[5,6-bis(4-chlorophenyl)-1-oxo-1H-pyrrolo[3,4-b]pyrazin-3-yl]- (9CI) (CA INDEX NAME)



RN 72368-05-9 ZCAPLUS
CN Urea, N,N''-(methyl-1,3-phenylene)bis[N'-(2,3-dimethyl-5-oxo-5H-pyrrolo[3,4-b]pyrazin-7-yl)- (9CI) (CA INDEX NAME)

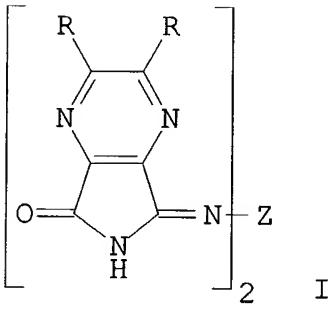


D1—Me

IT **72362-68-6P 72362-73-3P 72362-75-5P**
72362-76-6P 72362-77-7P 72362-78-8P
72362-79-9P 72362-80-2P 72362-82-4P
72362-83-5P 72362-84-6P 72362-85-7P
72362-86-8P 72362-87-9P 72362-88-0P
72362-89-1P 72368-05-9P
(pigments, light- and solvent-resistant, for coatings and inks, manuf. of)

L18 ANSWER 19 OF 25 ZCAPLUS COPYRIGHT 2004 ACS on STN
1979:422421 Document No. 91:22421 Pyrrolopyrazine pigments. Genda, Yoshikazu; Ametani, Tetsunari; Tomita, Nobuo; Ito, Masaru; Kano, Saburo (Nippon Soda Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 54029327 19790305 Showa, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1977-95355 19770809.

GI



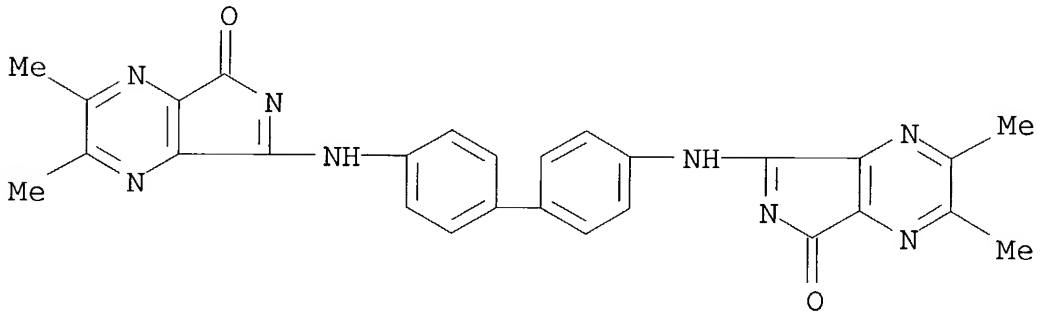
I

AB I (R = H, Me, furyl, Ph; Z = direct bond or arom. diamine residue) were prepd. and used as pigments in alkyd coatings and inks. For example, 7-amino-5-oxopyrrolo[3,4-b]pyrazine [70385-91-0] was treated with p-phenylenediamine dihydrochloride [624-18-0] in 2-C6H4Cl2 to give deep orange yellow I (R = H, Z = p-C6H4) [70385-96-5].

IT **70564-26-0 70564-27-1 70564-28-2**
70564-31-7 70564-32-8 70564-33-9
70564-34-0 70564-35-1 70564-36-2
70564-38-4 70598-71-9 70669-94-2
(pigments, for coatings and inks, manuf. of)

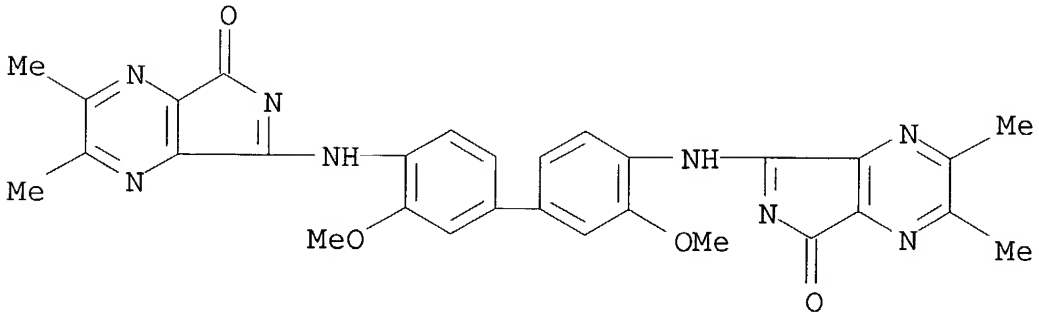
RN 70564-26-0 ZCAPLUS

CN 5H-Pyrrolo[3,4-b]pyrazin-5-one, 7,7'-([1,1'-biphenyl]-4,4'-diyldinitrilo)bis[6,7-dihydro-2,3-dimethyl- (9CI) (CA INDEX NAME)



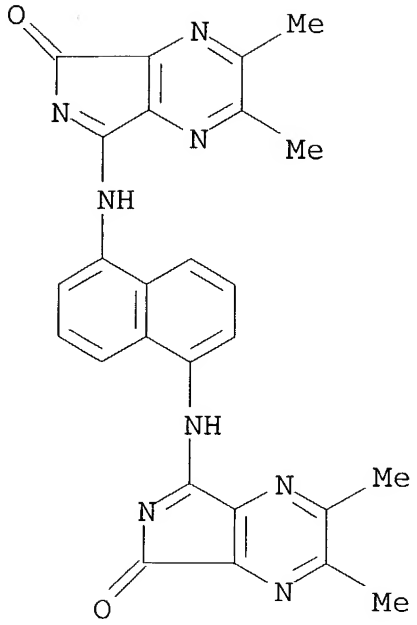
RN 70564-27-1 ZCAPLUS

CN 5H-Pyrrolo[3,4-b]pyrazin-5-one, 7,7'-[(3,3'-dimethoxy[1,1'-biphenyl]-4,4'-diyl)dinitrilo]bis[6,7-dihydro-2,3-dimethyl- (9CI) (CA INDEX NAME)

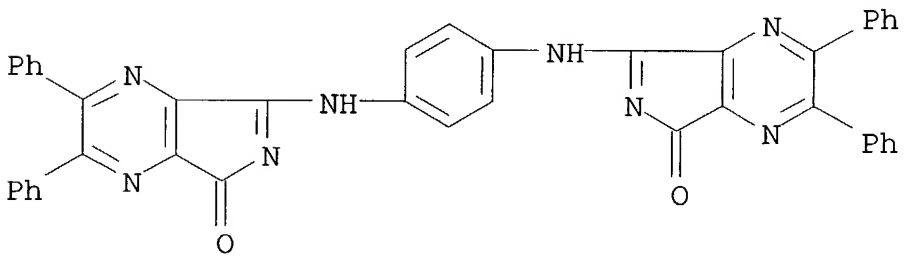


RN 70564-28-2 ZCAPLUS

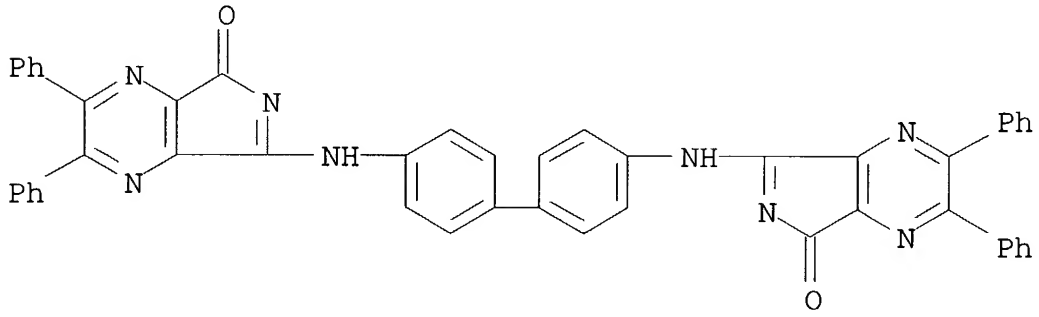
CN 5H-Pyrrolo[3,4-b]pyrazin-5-one, 7,7'-(1,5-naphthalenediyldinitrilo)bis[6,7-dihydro-2,3-dimethyl- (9CI) (CA INDEX NAME)



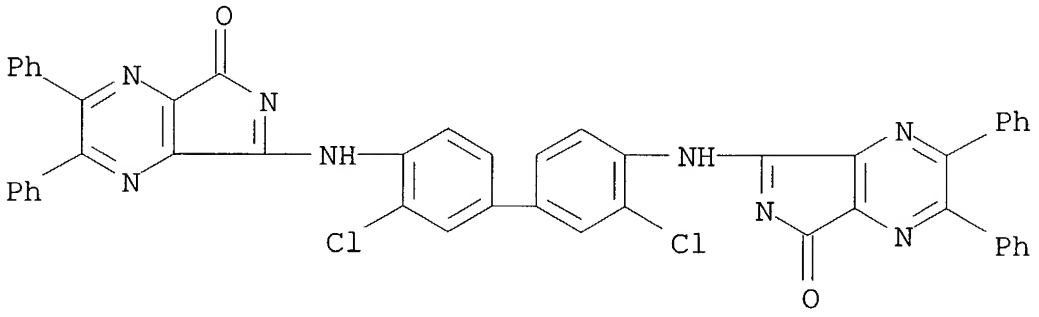
RN 70564-31-7 ZCAPLUS
CN 5H-Pyrrolo[3,4-b]pyrazin-5-one, 7,7'-(1,4-phenylenedinitrilo)bis[6,7-dihydro-2,3-diphenyl- (9CI) (CA INDEX NAME)



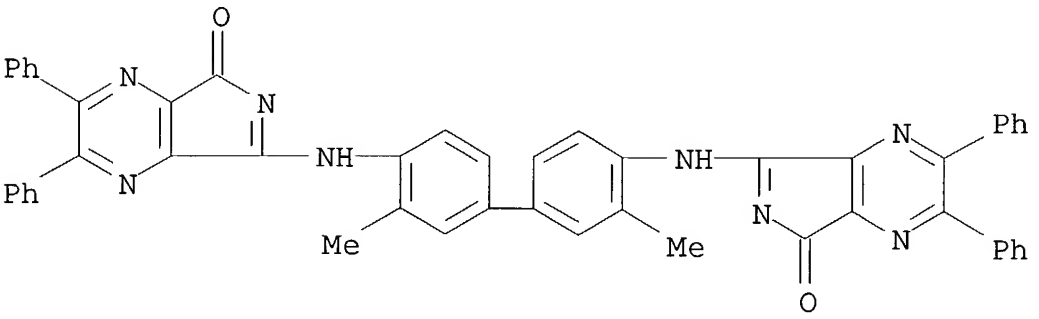
RN 70564-32-8 ZCAPLUS
CN 5H-Pyrrolo[3,4-b]pyrazin-5-one, 7,7'-([1,1'-biphenyl]-4,4'-diyldinitrilo)bis[6,7-dihydro-2,3-diphenyl- (9CI) (CA INDEX NAME)



RN 70564-33-9 ZCAPLUS
CN 5H-Pyrrolo[3,4-b]pyrazin-5-one, 7,7'-[(3,3'-dichloro[1,1'-biphenyl]-4,4'-diyl)dinitrilo]bis[6,7-dihydro-2,3-diphenyl- (9CI) (CA INDEX NAME)

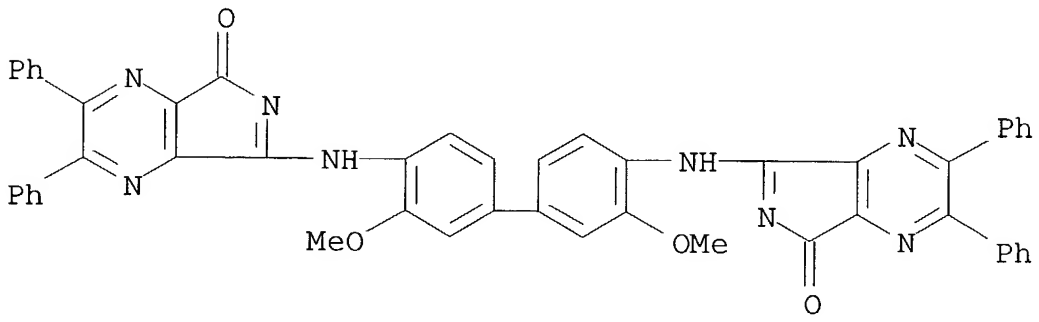


RN 70564-34-0 ZCAPLUS
CN 5H-Pyrrolo[3,4-b]pyrazin-5-one, 7,7'-[(3,3'-dimethyl[1,1'-biphenyl]-4,4'-diyl)dinitrilo]bis[6,7-dihydro-2,3-diphenyl- (9CI) (CA INDEX NAME)

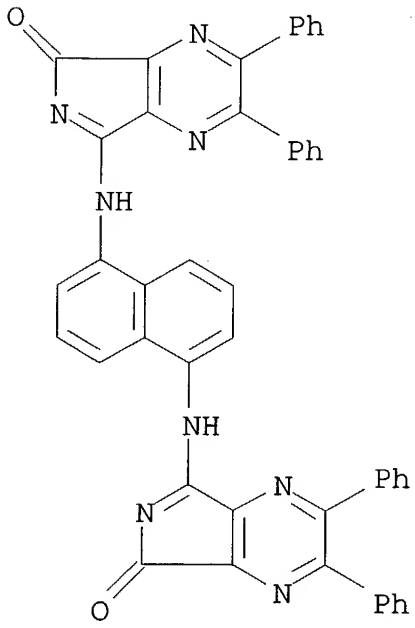


RN 70564-35-1 ZCAPLUS
CN 5H-Pyrrolo[3,4-b]pyrazin-5-one, 7,7'-[(3,3'-dimethoxy[1,1'-biphenyl]-

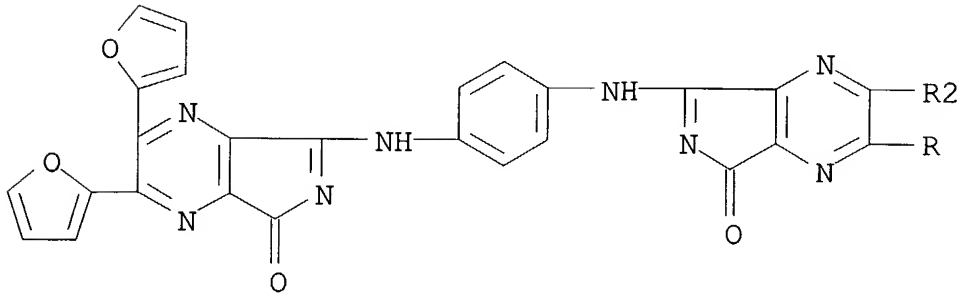
4,4'-diyl)dinitrilo]bis[6,7-dihydro-2,3-diphenyl- (9CI) (CA INDEX NAME)

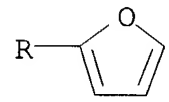


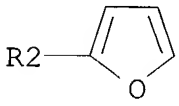
RN 70564-36-2 ZCAPLUS
CN 5H-Pyrrolo[3,4-b]pyrazin-5-one, 7,7'-(1,5-naphthalenediyldinitrilo)bis[6,7-dihydro-2,3-diphenyl- (9CI) (CA INDEX NAME)



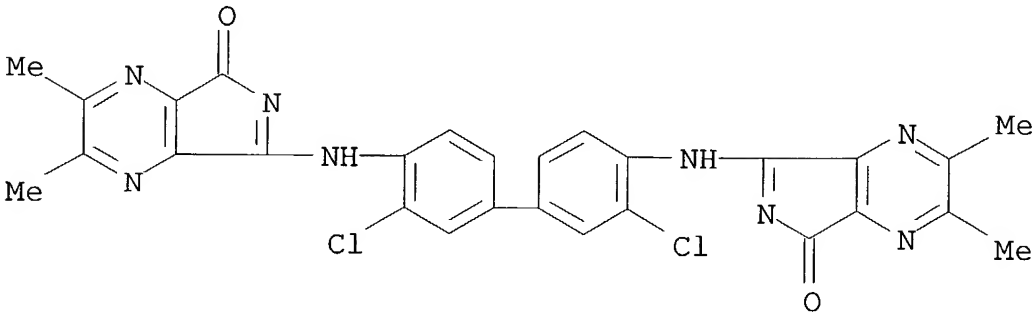
RN 70564-38-4 ZCAPLUS
CN 5H-Pyrrolo[3,4-b]pyrazin-5-one, 7,7'-(1,4-phenylenedinitrilo)bis[2,3-di-2-furanyl-6,7-dihydro- (9CI) (CA INDEX NAME)



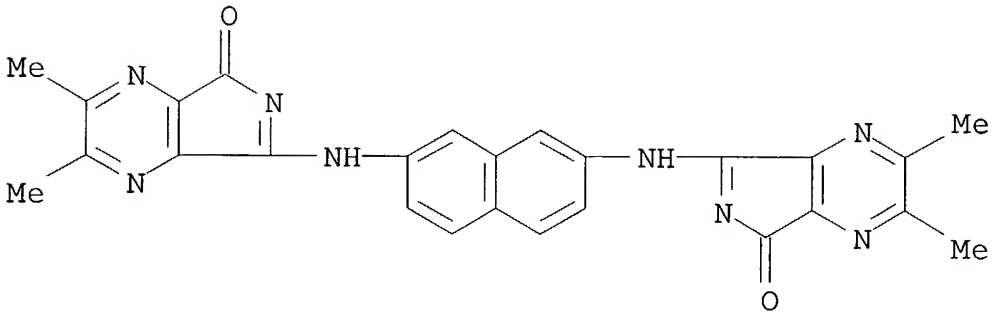




RN 70598-71-9 ZCAPLUS
CN 5H-Pyrrolo[3,4-b]pyrazin-5-one, 7,7'-[(3,3'-dichloro[1,1'-biphenyl]-4,4'-diyl)diimino]bis[2,3-dimethyl- (9CI) (CA INDEX NAME)



RN 70669-94-2 ZCAPLUS
CN 5H-Pyrrolo[3,4-b]pyrazin-5-one, 7,7'-(2,7-naphthalenediyldinitrilo)bis[6,7-dihydro-2,3-dimethyl- (9CI) (CA INDEX NAME)



IT **70564-26-0 70564-27-1 70564-28-2**
70564-31-7 70564-32-8 70564-33-9
70564-34-0 70564-35-1 70564-36-2
70564-38-4 70598-71-9 70669-94-2
(pigments, for coatings and inks, manuf. of)

L18 ANSWER 20 OF 25 ZCAPLUS COPYRIGHT 2004 ACS on STN
1977:493498 Document No. 87:93498 Photographic emulsions containing methine dyes having a 1H-imidazo[4,5-b]pyrazine nucleus. Gaugh, Wilbur Seth; Heseltine, Donald Warren; Sturmer, David Michael; Freeman, John Paul (Eastman Kodak Co., USA). U.S. US 4007170 19770208, 14 pp. Division of U.S. 3,936,308. (English). CODEN: USXXAM. APPLICATION: US 1974-483336 19740626.

GI For diagram(s), see printed CA Issue.

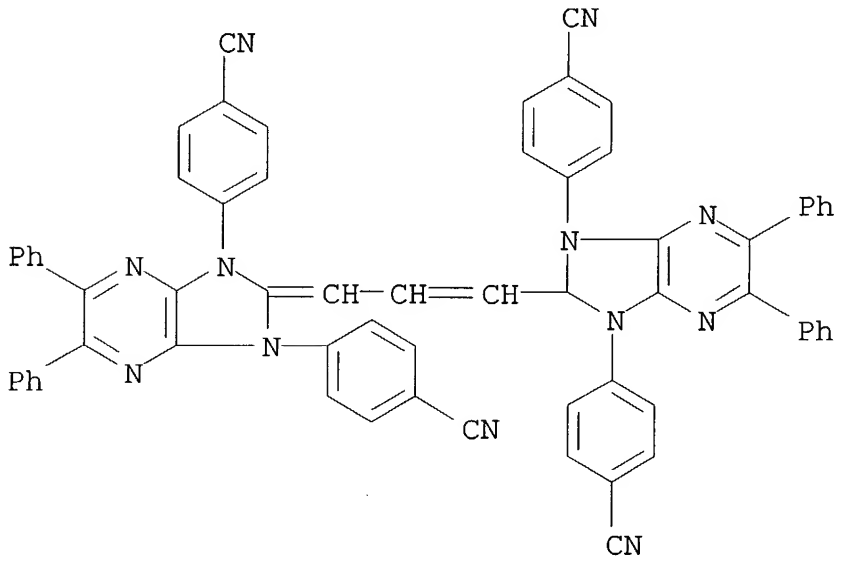
AB The methine dyes I, II, and III (R1, R2, R3 = alkyl, alkenyl, alkaryl, aryl; R4, R5 = alkyl, alkenyl, alkaryl, aryl, alkoxy, halo, cyano; X- = acid anion; Z = nonmetallic atoms required to complete a 5-6 member heterocyclic ring of the type used in cyanine dyes; Z1 = nonmetallic atoms required to complete a 5-6 member heterocyclic ring of the type used in merocyanine dyes; n = 1-4; m = 1-2; p = 1-3) are used as spectral sensitizers for Ag halide photog. emulsions. Thus, a Au- and S-sensitized Ag(Br,I) (2.5 mol % I) emulsion (0.2 μ cubic grains) was spectrally sensitized with 1,1',3,3'-tetraethyl-5,5',6,6'-tetramethyl-1H-imidazo[4,5-b]pyrazinocarbocyanine perchlorate at 10-4 mol/mol Ag, coated on a cellulose acetate support, sensitometrically exposed through a wedge spectrograph and a continuous step wedge using a Wratten 16 filter (minus blue), developed in a hydroquinone developer, fixed, washed, and dried to show a sensitizing range, sensitizing max., relative 365 line speed, relative minus blue speed, and fog of 500-625 nm, 600 nm, 229, 631, and 0.35, resp., vs.-, 540 nm, 214, 100, and 0.06, resp., for a control spectrally sensitized with 3-carboxymethyl-5-[(3-methyl-2-thiazolidinylidene)-1-methylethylidene]rhodamine.

IT **57038-17-2 57038-19-4 57038-25-2**
57038-29-6
(photog. spectral sensitizer)

RN 57038-17-2 ZCAPLUS
CN 1H-Imidazo[4,5-b]pyrazinium, 2-[3-[1,3-bis(4-cyanophenyl)-1,3-dihydro-5,6-diphenyl-2H-imidazo[4,5-b]pyrazin-2-ylidene]-1-propenyl]-1,3-bis(4-cyanophenyl)-5,6-diphenyl-, perchlorate (9CI) (CA INDEX NAME)

CM 1

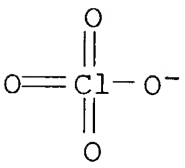
CRN 57038-16-1
CMF C65 H39 N12



*** FRAGMENT DIAGRAM IS INCOMPLETE ***

CM 2

CRN 14797-73-0
CMF Cl O4

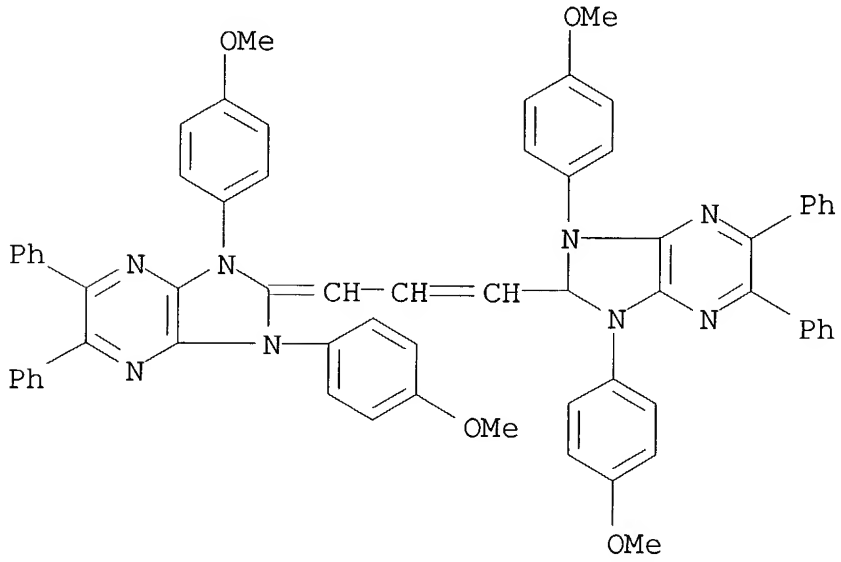


RN 57038-19-4 ZCAPLUS
CN 1H-Imidazo[4,5-b]pyrazinium, 2-[3-[1,3-dihydro-1,3-bis(4-

methoxyphenyl)-5,6-diphenyl-2H-imidazo[4,5-b]pyrazin-2-ylidene]-1-propenyl]-1,3-bis(4-methoxyphenyl)-5,6-diphenyl-, perchlorate (9CI) (CA INDEX NAME)

CM 1

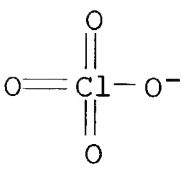
CRN 57038-18-3
CMF C65 H51 N8 O4



*** FRAGMENT DIAGRAM IS INCOMPLETE ***

CM 2

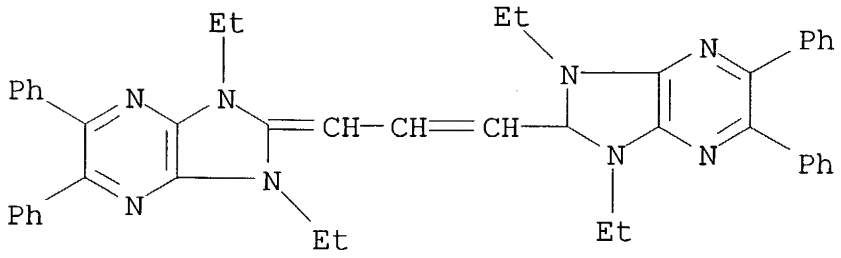
CRN 14797-73-0
CMF Cl O4



RN 57038-25-2 ZCAPLUS
CN 1H-Imidazo[4,5-b]pyrazinium, 2-[3-(1,3-diethyl-1,3-dihydro-5,6-diphenyl-2H-imidazo[4,5-b]pyrazin-2-ylidene)-1-propenyl]-1,3-diethyl-5,6-diphenyl-, perchlorate (9CI) (CA INDEX NAME)

CM 1

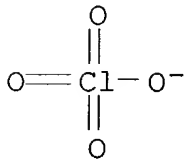
CRN 57038-24-1
CMF C45 H43 N8



*** FRAGMENT DIAGRAM IS INCOMPLETE ***

CM 2

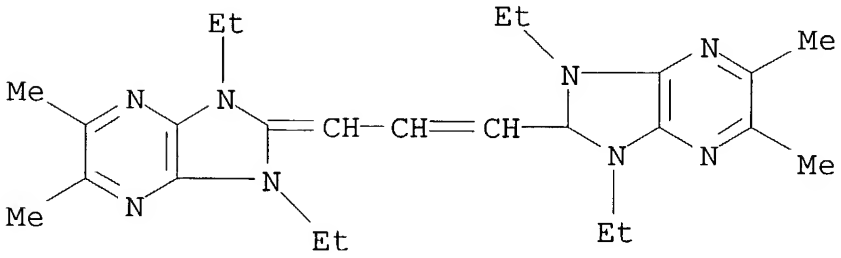
CRN 14797-73-0
CMF Cl O4



RN 57038-29-6 ZCAPLUS
CN 1H-Imidazo[4,5-b]pyrazinium, 2-[3-(1,3-diethyl-1,3-dihydro-5,6-dimethyl-2H-imidazo[4,5-b]pyrazin-2-ylidene)-1-propenyl]-1,3-diethyl-5,6-dimethyl-, perchlorate (9CI) (CA INDEX NAME)

CM 1

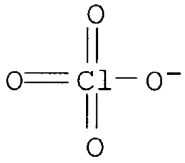
CRN 57038-28-5
CMF C25 H35 N8



*** FRAGMENT DIAGRAM IS INCOMPLETE ***

CM 2

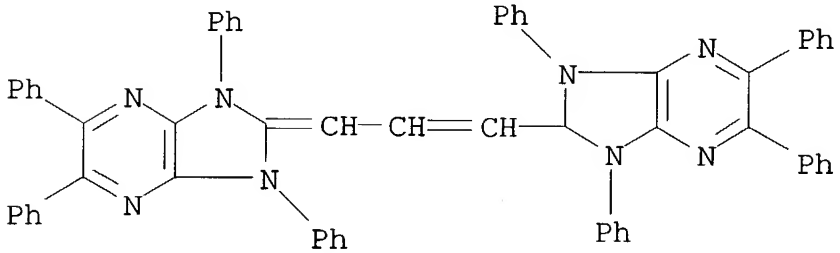
CRN 14797-73-0
CMF Cl O4



IT **57038-66-1P**
(prepn. of)
RN 57038-66-1 ZCAPLUS
CN 1H-Imidazo[4,5-b]pyrazinium, 2-[3-(1,3-dihydro-1,3,5,6-tetraphenyl-2H-imidazo[4,5-b]pyrazin-2-ylidene)-1-propenyl]-1,3,5,6-tetraphenyl-, perchlorate (9CI) (CA INDEX NAME)

CM 1

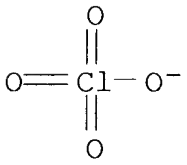
CRN 57038-65-0
CMF C61 H43 N8



*** FRAGMENT DIAGRAM IS INCOMPLETE ***

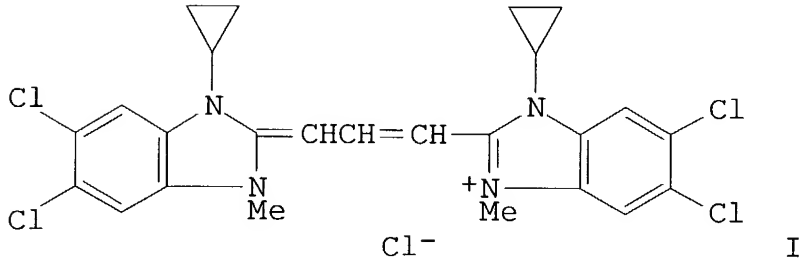
CM 2

CRN 14797-73-0
CMF Cl O4

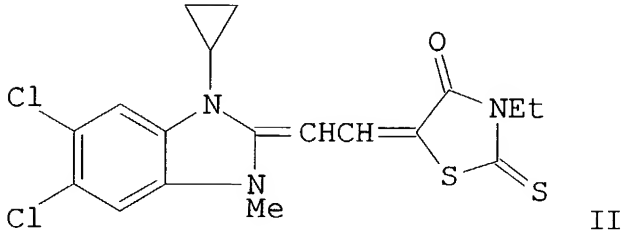


IT **57038-17-2 57038-19-4 57038-25-2**
57038-29-6
(photog. spectral sensitizer)
IT **57038-66-1P**
(prepn. of)

L18 ANSWER 21 OF 25 ZCAPLUS COPYRIGHT 2004 ACS on STN
1976:594074 Document No. 85:194074 Polymethine dyes with N-cycloalkyl substituents. Sturmer, David M.; Freeman, John Paul; Ho, Margaret S. (UK). Research Disclosure, 149, 58-61 (No. 14978) (English) 1976. RD 149078 19760910. CODEN: RSDSBB. ISSN: 0374-4353. PRIORITY: RD 1976-149078 19760910.
GI



I



II

AB Cyanine and merocyanine dyes contg. the N-cyclopropyl and N-cyclopentyl groups and their intermediates were prepd., the dyes are useful as sensitizers in Ag halide emulsions. Typical examples of the dyes prepd. are: I [60879-07-4] and II [60879-08-5].

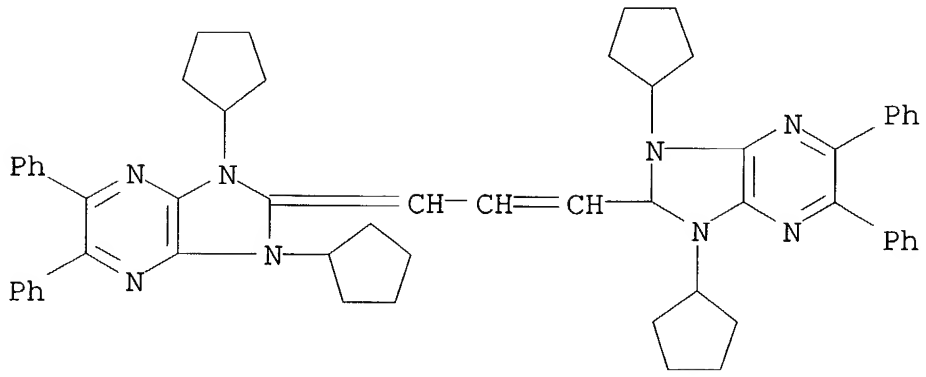
IT **60878-92-4 60878-94-6**
(spectrum of)

RN 60878-92-4 ZCAPLUS

CN 1H-Imidazo[4,5-b]pyrazinium, 1,3-dicyclopentyl-2-[3-(1,3-dicyclopentyl-1,3-dihydro-5,6-diphenyl-2H-imidazo[4,5-b]pyrazin-2-ylidene)-1-propenyl]-5,6-diphenyl-, salt with 4-methylbenzenesulfonic acid (1:1) (9CI) (CA INDEX NAME)

CM 1

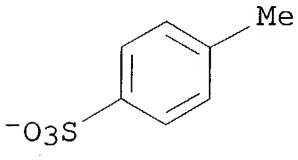
CRN 60878-91-3
CMF C57 H59 N8



*** FRAGMENT DIAGRAM IS INCOMPLETE ***

CM 2

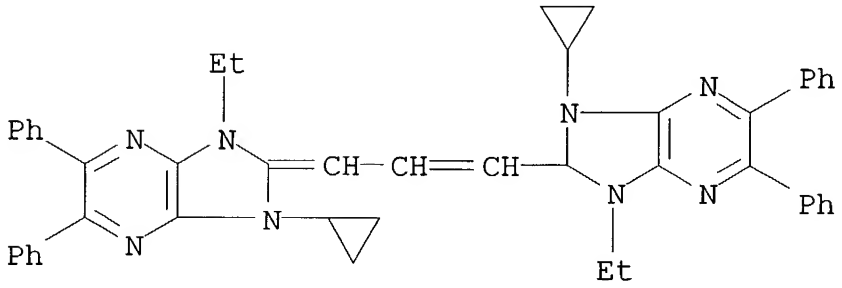
CRN 16722-51-3
CMF C7 H7 O3 S



RN 60878-94-6 ZCAPLUS
CN 1H-Imidazo[4,5-b]pyrazinium, 1-cyclopropyl-2-[3-(1-cyclopropyl-3-ethyl-1,3-dihydro-5,6-diphenyl-2H-imidazo[4,5-b]pyrazin-2-ylidene)-1-propenyl]-3-ethyl-5,6-diphenyl-, perchlorate (9CI) (CA INDEX NAME)

CM 1

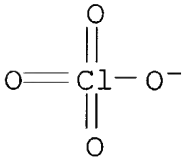
CRN 60878-93-5
CMF C47 H43 N8



*** FRAGMENT DIAGRAM IS INCOMPLETE ***

CM 2

CRN 14797-73-0
CMF Cl O4



IT **60878-92-4 60878-94-6**
(spectrum of)

L18 ANSWER 22 OF 25 ZCAPLUS COPYRIGHT 2004 ACS on STN
1976:534192 Document No. 85:134192 Correlation between photographic properties of dyes and their electrochemical and spectroscopic parameters. Loutfy, R. O.; Sharp, J. H. (Xerox Res. Cent. Canada Ltd., Mississauga, ON, Can.). Photographic Science and Engineering, 20(4), 165-74 (English) 1976. CODEN: PSENAC. ISSN: 0031-8760.

AB The interrelation between electrochem. redox potentials, gas phase ionization potential and electron affinities, spectral excitation energies, and mol. calcd. energy levels for cyanine dyes were reviewed and examd. against reported exptl. results. A linear free energy relationship between the energy of singlet excited states and the abs. difference between the oxidn. and redn. potentials for more than 50 cyanine dyes was obsd. This relation was utilized to calc. the true oxidn. potential of dyes whose Eox1/2 is not available. the fundamentals of photog. dye sensitization were reexamd. and a simple physicochem. parameter (Eox + ER) was found to relate to the ability of a dye to act as a spectral sensitizer. The prediction of the developed theory was in excellent qual. agreement with exptl.

observations.

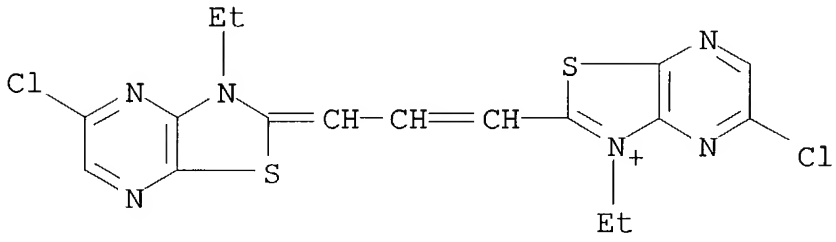
IT **60573-25-3**
(photog. spectral sensitization and desensitization by, electrochem. and spectroscopic parameters in relation to)

RN 60573-25-3 ZCAPLUS

CN Thiazolo[4,5-b]pyrazinium, 5-chloro-2-[3-(5-chloro-3-ethylthiazolo[4,5-b]pyrazin-2(3H)-ylidene)-1-propenyl]-3-ethyl-, salt with 4-methylbenzenesulfonic acid (1:1) (9CI) (CA INDEX NAME)

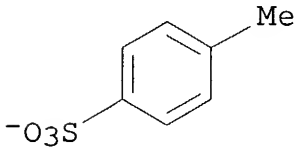
CM 1

CRN 60573-24-2
CMF C17 H15 Cl2 N6 S2



CM 2

CRN 16722-51-3
CMF C7 H7 O3 S



IT **60573-25-3**
(photog. spectral sensitization and desensitization by, electrochem. and spectroscopic parameters in relation to)

L18 ANSWER 23 OF 25 ZCAPLUS COPYRIGHT 2004 ACS on STN
1975:607577 Document No. 83:207577 Methine dyes and emulsions containing them. Gaugh, W. S.; Heseltine, D. W.; Sturmer, D. M.; Freeman, J. P. (Eastman Kodak Co., USA). Belg. BE 818955 19750217, 39 pp. (French). CODEN: BEXXAL. APPLICATION: BE 1974-147704 19740816.

GI For diagram(s), see printed CA Issue.

AB Thirty-four cyanine and 1 merocyanine dye contg. the 1H-imidazo[4,5-b]pyrazine residue were prepd. and were useful as filter dye, desensitizers, and sensitizers for photog. purposes. Thus, 2-methyl-1,3,5,6-tetraphenyl-1H-imidazo[4,5-b]pyrazinium tosylate [57038-13-8] was treated with (EtO)2CHOAc in pyridine to give I [**57038-66-1**]. Other typical dyes prepd. are II [55199-40-1] and III [57038-67-2].

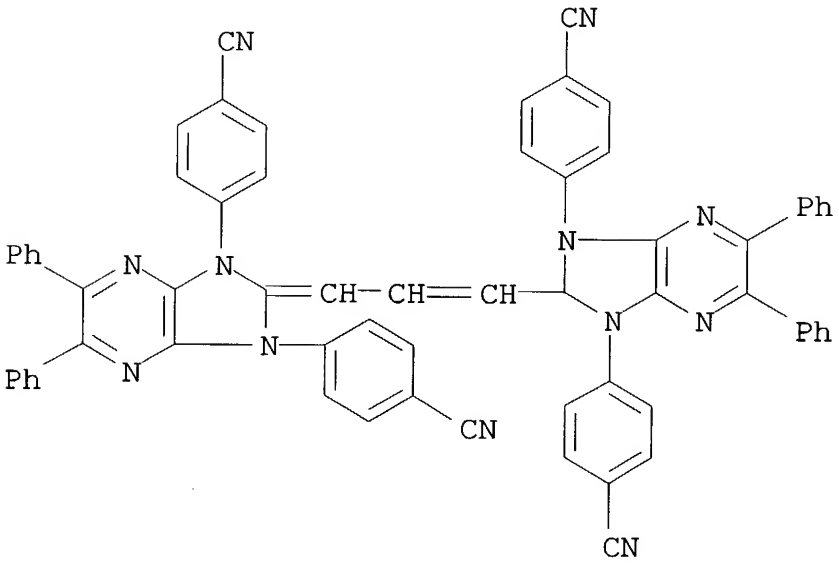
IT **57038-17-2P 57038-19-4P 57038-25-2P 57038-29-6P 57038-66-1P**
(prepn. of)

RN 57038-17-2 ZCAPLUS

CN 1H-Imidazo[4,5-b]pyrazinium, 2-[3-[1,3-bis(4-cyanophenyl)-1,3-dihydro-5,6-diphenyl-2H-imidazo[4,5-b]pyrazin-2-ylidene]-1-propenyl]-1,3-bis(4-cyanophenyl)-5,6-diphenyl-, perchlorate (9CI) (CA INDEX NAME)

CM 1

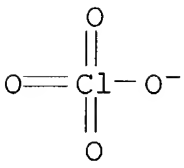
CRN 57038-16-1
CMF C65 H39 N12



*** FRAGMENT DIAGRAM IS INCOMPLETE ***

CM 2

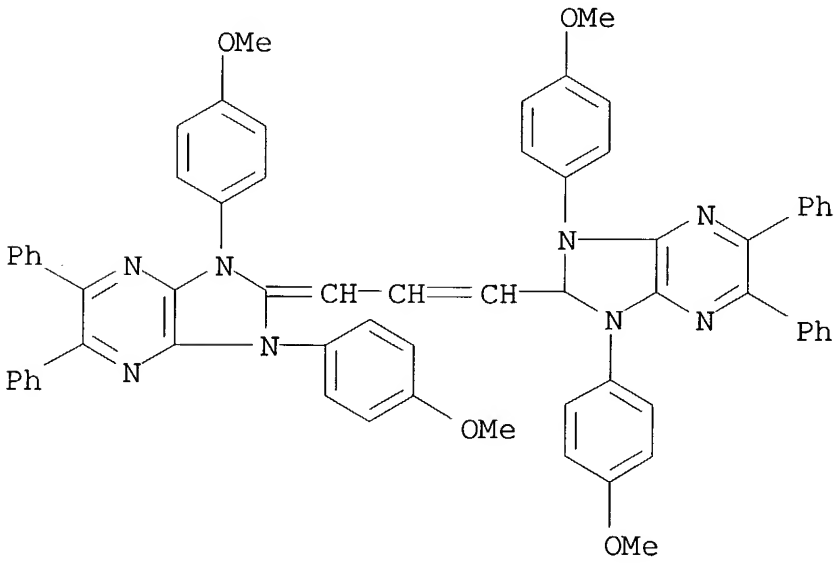
CRN 14797-73-0
CMF Cl O4



RN 57038-19-4 ZCAPLUS
CN 1H-Imidazo[4,5-b]pyrazinium, 2-[3-[1,3-dihydro-1,3-bis(4-methoxyphenyl)-5,6-diphenyl-2H-imidazo[4,5-b]pyrazin-2-ylidene]-1-propenyl]-1,3-bis(4-methoxyphenyl)-5,6-diphenyl-, perchlorate (9CI) (CA INDEX NAME)

CM 1

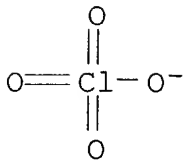
CRN 57038-18-3
CMF C65 H51 N8 O4



*** FRAGMENT DIAGRAM IS INCOMPLETE ***

CM 2

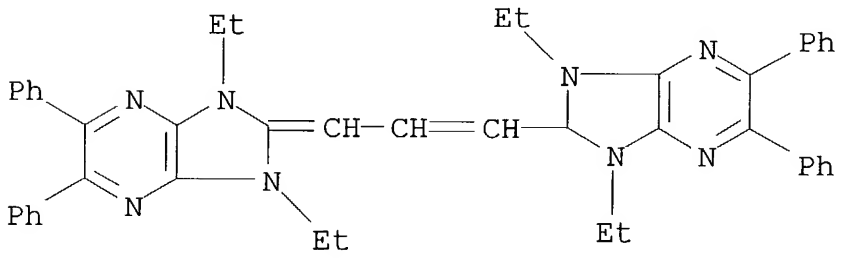
CRN 14797-73-0
CMF Cl O4



RN 57038-25-2 ZCAPLUS
CN 1H-Imidazo[4,5-b]pyrazinium, 2-[3-(1,3-diethyl-1,3-dihydro-5,6-diphenyl-2H-imidazo[4,5-b]pyrazin-2-ylidene)-1-propenyl]-1,3-diethyl-5,6-diphenyl-, perchlorate (9CI) (CA INDEX NAME)

CM 1

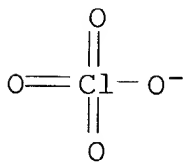
CRN 57038-24-1
CMF C45 H43 N8



*** FRAGMENT DIAGRAM IS INCOMPLETE ***

CM 2

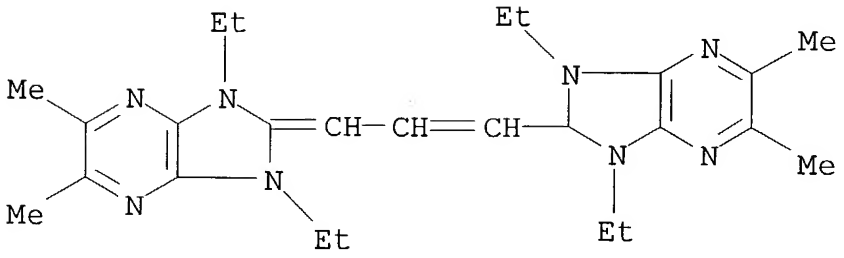
CRN 14797-73-0
CMF Cl O4



RN 57038-29-6 ZCAPLUS
CN 1H-Imidazo[4,5-b]pyrazinium, 2-[3-(1,3-diethyl-1,3-dihydro-5,6-dimethyl-2H-imidazo[4,5-b]pyrazin-2-ylidene)-1-propenyl]-1,3-diethyl-5,6-dimethyl-, perchlorate (9CI) (CA INDEX NAME)

CM 1

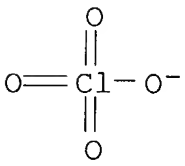
CRN 57038-28-5
CMF C25 H35 N8



*** FRAGMENT DIAGRAM IS INCOMPLETE ***

CM 2

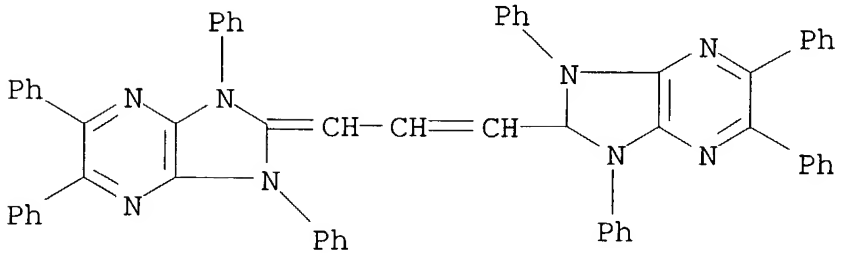
CRN 14797-73-0
CMF Cl O4



RN 57038-66-1 ZCAPLUS
CN 1H-Imidazo[4,5-b]pyrazinium, 2-[3-(1,3-dihydro-1,3,5,6-tetraphenyl-2H-imidazo[4,5-b]pyrazin-2-ylidene)-1-propenyl]-1,3,5,6-tetraphenyl-, perchlorate (9CI) (CA INDEX NAME)

CM 1

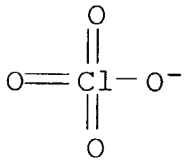
CRN 57038-65-0
CMF C61 H43 N8



*** FRAGMENT DIAGRAM IS INCOMPLETE ***

CM 2

CRN 14797-73-0
CMF Cl O4



IT **57038-17-2P 57038-19-4P 57038-25-2P**
57038-29-6P 57038-66-1P
(prepn. of)

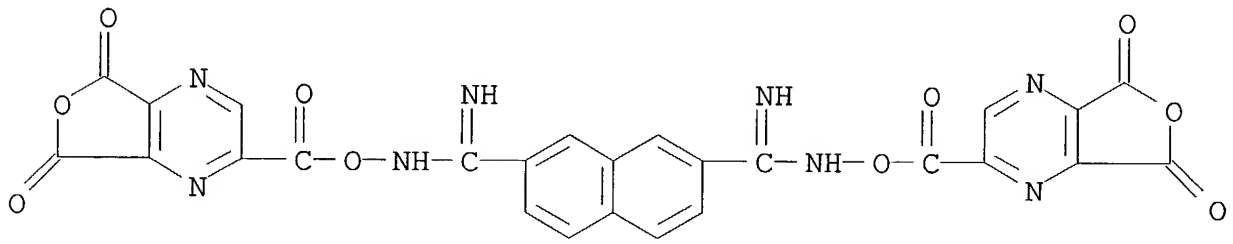
L18 ANSWER 24 OF 25 ZCAPLUS COPYRIGHT 2004 ACS on STN
1972:86370 Document No. 76:86370 Acid anhydrides. Hagiwara, Yoichi; Kuwahara, Masaru; Toyama, Shunroku; Dogoshi, Noriaki; Ida, Naoya (Toray Industries, Inc.). Jpn. Tokkyo Koho JP 46024009 B4 19710709 Showa, 6 pp. (Japanese). CODEN: JAXXAD. APPLICATION: JP 19661228.

AB Ten acid anhydride esters of amidoximes were prepd. by treating an acid anhydride monoacid chloride with the appropriate amidoxime. For example, treatment of trimellitic anhydride monoacid chloride with isophthalamidoxime in N-methylpyridone at-40.deg. gave O,O'-isophthalamidoxime bis(trimellitic anhydride monoester) (I) [22590-48-3]. Heating I with Ac2O in pyridine at 100.deg. for 2 hr gave 4,4'-[3,3'-(m-phenylene)di-1,2,4-oxadiazol-5-yl]bid(phthalic anhydride) (II) [34072-20-3]. The products were useful for prepg. thermally stable polymers or as curing agents for resins.

IT **35433-11-5P**
(prepn. of)

RN 35433-11-5 ZCAPLUS

CN 2,7-Naphthalenedicarboximidamide, N,N''-bis[[(5,7-dihydro-5,7-dioxofuro[3,4-b]pyrazin-2-yl)carbonyl]oxy]- (9CI) (CA INDEX NAME)



IT **35433-11-5P**
(prepn. of)

L18 ANSWER 25 OF 25 ZCAPLUS COPYRIGHT 2004 ACS on STN
1971:142667 Document No. 74:142667 Poly(amide imides). Yoda, Naoya; Kurihara, Masaru; Dogoshi, Noriaki; Tanaka, Chiaki; Eguchi, Masaomi (Toray Industries, Inc.). Ger. Offen. DE 2039448 19710225, 62 pp. (German). CODEN: GWXXBX. PRIORITY: JP 19690811 - 19700507 19700507.

GI For diagram(s), see printed CA Issue.

AB Poly-(amide imides) with a highly linear structure, and excellent thermal stability are prepd. by polycondensation of anhydrides of tricarboxylic acid anhydrides with aminocarboxylic acids and (or) diamines to form a carboxyl or anhydride-terminated oligomer which is further condensed with diisocyanates to yield a poly(amide imide) useful as coatings and films. A typical prepn. comprises treating 4,4'-(oxydicarbonyl)bis(phthalic anhydride) (I) with p-H2NC6H4CO2H in N-methylpyrrolidinone, heating 3 hr at 185°, treating the oligomer with 4,4'-diphenylmethane diisocyanate, and condensing an addnl. 2 hr at 170°. The polymer soln. is used to apply abrasion and alkali-resistant coatings to Cu. Other poly(amide imides) are prepd. using 6,6'-oxydicarbonylbis(2,3-naphthalenedicarboxylic anhydride), oxydicarbonylbis(cyclopropanedicarboxylic anhydride) or 5,5'-oxydicarbonylbis(2,3-pyridinedicarboxylic anhydride) as the anhydride, 4,4'-diaminodiphenylmethane, m-C6H4(NH2)2, or 4-amino-4'-carboxydiphenyl ketone as the aminocarboxylic or diamine component, and tolylene diisocyanate or OCN(CH2)6NCO as the diisocyanate.

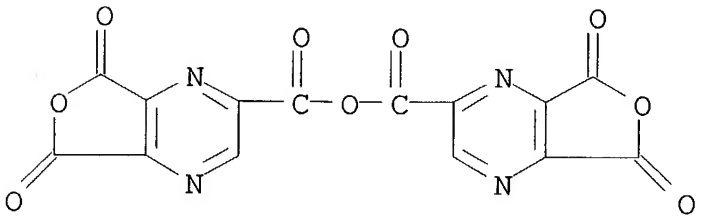
IT **32071-50-4**
(polyimides)

RN 32071-50-4 ZCAPLUS

CN 2,3,5-Pyrazinetricarboxylic acid, 5,5'-anhydride, cyclic 2,3:2',3'-dianhydride, polymer with p-aminobenzoic acid, hexamethylene isocyanate and m-phenylenediamine (8CI) (CA INDEX NAME)

CM 1

CRN 47549-04-2
CMF C14 H2 N4 O9

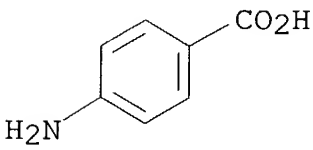


CM 2

CRN 822-06-0
CMF C8 H12 N2 O2

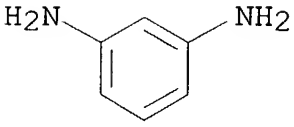
CM 3

CRN 150-13-0
CMF C7 H7 N O2



CM 4

CRN 108-45-2
CMF C6 H8 N2



IT **32071-50-4**
(polyimides)